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AUTHOR Allen, Charles
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ABSTRACT

Several intermediate performance objectives and corresponding criterion measures are listed for each of 12 terminal objectives for a basic drafting course. The materials were developed for a two-semester course (2 hours daily). The organized classroom and shop experiences are designed to enable the student to develop general competencies in the use of drafting instruments, fundamental rules of drafting, and the ability to lay out and develop drawings in the architectural, structural, and machine drawing fields. Instruction covers geometrical construction, descriptive geometry, third quadrant projection, auxiliary planes, sectioning, and pictorial drawing. Titles of the 12 terminal objectives are Orientation, Vica and Safety; Scaled Dimensions; Pencil Linework; Object Drawing Stressing Arcs and Tangents; Coordinate Geometry and Model Development; Multi-view/Isometric Associate Development; Sectioning and Architectural Detailing; Small Building Plan Sets; Basic Meets and Bounds, Plotting Bearings; Civil Technology; Vica Leadership Development and Public Relations; and Certification Goals in Engineering Technology. (This manual and 54 others were developed for various secondary level vocational courses using the System Approach for Education (SAFE) guidelines.) (HD)

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drafting

PERFORMANCE OBJECTIVES

BASIC COURSE

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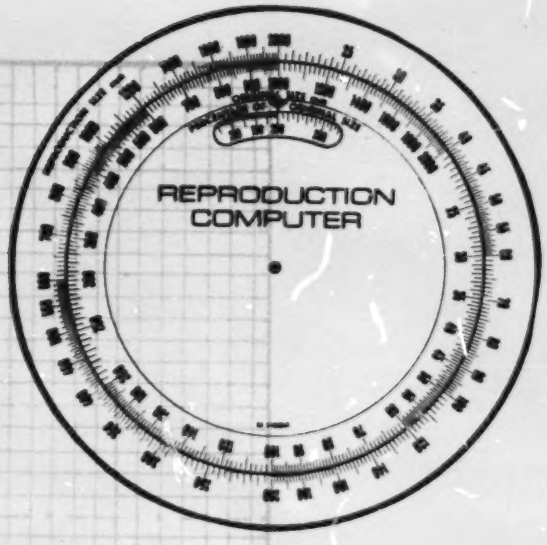

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July, 1975

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A C K N O W L E D G E M E N T S

This manual was developed using System Approach For Education (SAFE) guidelines.

Appreciation and recognition are extended to the following educators who have assisted in the preparation of this manual:

Mr. Lowell Meckley, Coordinator
School Industry Education

Mr. Joseph Killough, Coordinator
School Industry Education

Mr. Charles Downing, Supervisor
Vocational-Technical Education

The following educator participated as the writer of this manual:

Mr. Charles Allen, Instructor

Cover design and printing by Mr. Chester Seivert

Typist: Cathy Boatright

DRAFTING - BASIC

ACCREDITATION NUMBER: 9257

LENGTH OF COURSE: 2 Semesters

TIME BLOCK: 2 Hours Daily

COURSE DESCRIPTION

Organized classroom and shop experiences designed to enable the student to develop general competencies as a Draftsman. Skills are developed in the use of drafting instruments, fundamental rules of drafting, and the ability to lay out and develop drawings in the architectural, structural and machine drawing fields. Instruction includes: use of drawing instruments and materials; geometrical construction; descriptive geometry; third quadrant projection; auxiliary planes; sectioning; and pictorial drawing. Students are encouraged to participate in the activities of the Vocational Industrial Clubs of America.

DRAFTING - BASIC

3257

Syllabus of Terminal Performance Objectives

0.0 Curriculum Objective

1.0 Orientation, Vica and Safety

2.0 Scaled Dimensions

3.0 Pencil Linework

4.0 Object Drawing Stressing Arcs and Tangents

5.0 Coordinate Geometry and Model Development

6.0 Multi-view/Isometric Associate Development

7.0 Sectioning and Architectural Detailing

8.0 Small Building Plan Sets

9.0 Basic Meets and Bounds, Plotting Bearings

10.0 Civil Technology

11.0 Vica Leadership Development and Public Relations

12.0 Certification Goals in Engineering Technology

COURSE PAINTING - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 1.0

ORIENTATION, SAFETY & MICA

Given a written examination covering shop, school and occupational safety, the learner will correctly answer 80% of the test items.

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
		1.0	See test attached.
1.1	Given an 18 item true-false test concerning the origin and purposes of OSHA, the student will correctly answer 16 items.	1.1	See test attached.
1.2	Given a completion test on the ability to examine the "Federal Register" for safety requirements, the learner will correctly answer 95% of the items.	1.2	See test attached.
1.3	Given a completion test concerning "Means of Egress" the student will correctly answer 95% of the items.	1.3	See test attached.
1.4	Given tables for environmental contaminants and a completion type test, the learner will, with 95% accuracy, properly read the tables to extract correct answers for the test items.	1.4	See test attached.
1.5	Given a written test concerning OSHA electrical power, grounding, and safety controlling devices, the learner will complete the test with 95% accuracy.	1.5	See test attached.

COURSE DRAFTING - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 1.0 (cont'd) ORIENTATION, SAFETY & VICA

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
1.6	Given a teacher-made test concerning the organization, history and advantages of VICA, the learner will score at least 95% accuracy.	1.6	See test attached.
1.7	Given a VICA safety contest application, the learner will correctly fill out the application and will complete the safety project proposed in the application to the satisfaction of the VICA safety committee.	1.7	See attached VICA safety contest application.

IPO 1.1 - DRAFTING-BASIC

ORIENTATION, SAFETY & VICA

Opposite (and at the beginning) of each of the following statements concerning OSHA, circle the letter "T" if you think the statement is TRUE, or "F" is you think it is FALSE.

T F Safety is the responsibility of the employer, not the employee.

T F OSHA is applicable only in Florida.

T F OSHA standards were first issued on May 29, 1971, although the law is known as "The Occupational Safety and Health Act of 1970.

T F The rules and regulations governing OSHA are set forth in a government publication titled "federal register".

T F The rules and regulations of OSHA are the maximum requirements.

T F Architects and Engineers are not concerned with safety codes and rules and regulations.

T F OSHA is concerned about loss of work time from both accident and sickness.

T F NEC stands for the National Electric Code.

T F Record keeping is the responsibility of the employee.

T F A catastrophe or fatality in any plant will trigger an OSHA inspection.

T F OSHA standards do not apply to American Samoa and Guam.

T F OSHA throws out all safety regulations developed up to this time.

T F Longshoring is exempt from OSHA standards.

T F Any state legislature can make their safety regulations more strict than OSHA if they so desire.

The letters OSHA are used as a word, but they are really an abbreviation. Indicate True or False for the following:

T F O stands for Occupational

T F S stands for Safety

T F H stands for Health

T F A stands for Act

NAME: _____

DATE: _____

IPO 1.2 (cont'd)

ORIENTATION, SAFETY & VICA

[illegible] ladder, and [illegible] and [illegible] between rungs at the [illegible] shall not exceed [illegible] inches [illegible] throughout the length of the ladder. Steps, [illegible] shall be free of [illegible]; sharp edges, burrs, or projections shall be a [illegible].

[illegible] ACTION: Adequate [illegible] shall be employed to prevent metals from [illegible] action when such metals are [illegible].

CLEARANCE IN BACK OF LADDER: The distance from the centerline of [illegible], or [illegible] to the nearest permanent object in back of ladder shall be not less than [illegible] inches.

SIDE-ACCESS DISTANCE: The step-across distance from the nearest edge of ladder to the nearest edge of equipment or structure shall be not more than [illegible] inches, or less than [illegible] inches (Fig. 8-4). Cages or rails conforming to the dimensions shown in Figures 8-7, 8-8, and 8-9 shall be provided on ladders of more than [illegible] feet to a maximum unbroken rise of [illegible] feet. Cages shall extend a minimum of [illegible] inches above the point of landing, unless other acceptable protection is provided. Cages shall extend down the ladder to a point not less than [illegible] feet nor more than [illegible] feet above the base of the ladder, with bottom flared not less than [illegible] inches, or portion of cage opposite ladder shall be curved to the base. Cages shall not extend less than [illegible] nor more than [illegible] inches from the centerline of the rungs of the ladder. Cage shall not be less than [illegible] inches in width. The inside shall be clear of projections. Vertical bars shall be located at a maximum spacing of [illegible] degrees around the circumference of the cage; this will give maximum spacing of [illegible] approximately [illegible] inches, center to center. Ladder wells shall have a width of at least [illegible] inches measured each way from the centerline of the minimum of [illegible] inches from the centerline of rungs to the wall or on the obstructions on the climbing side of the ladder exist, there shall be a minimum of [illegible] inches from the centerline of the rungs. Where a man has to step a distance greater than [illegible] inches from the centerline of the rung of a ladder to the nearest edge of structure or equipment, a landing platform [illegible] be provided. The landing distance shall be [illegible] inches. All landing platforms shall be equipped with [illegible] railing, and [illegible], so arranged as to give access to the ladder. Platforms shall be not less than [illegible] inches in width by [illegible] inches in length. [illegible] rung of any section of ladder shall be located at the [illegible] of the [illegible] of the landing, [illegible] served by the ladder.

IPO 1.3 - DRAFTING

ORIENTATION, SAFETY & VICA

This is an open book completion type test. All of the critical information must be correctly filled in as the regulations are reviewed. All numbers and letters must be neat and legible.

MEANS OF EGRESS: A means of egress is a continuous and unobstructed way of _____ travel from any point in a building or structure to a _____ and consists of _____ separate and distinct parts: the _____ of exit _____, the _____, and the way of exit _____. A means of egress comprises the _____ and _____ ways of travel and _____ include intervening room spaces, doorways, hallways, corridors, passageways, balconies, ramps, stairs, enclosures, lobbies, escalators, horizontal exits, _____ and _____.

LOW HAZARD CONTENTS: Low hazard contents shall be classified as those of such _____ combustibility that no _____ propagating fire therein _____ occur and that consequently the only probably danger requiring the use of emergency exits will be from _____, fumes, or _____, or fire from some _____ source.

HIGH-HAZARD CONTENTS: High-hazard contents shall be classified as those which are _____ to burn with _____ rapidity or from which poisonous _____ or explosions are to be feared in the event of fire.

ORDINARY HAZARD CONTENTS: Ordinary hazard contents _____ be classified as those which are _____ to burn with _____ rapidity or from which poisonous _____ or explosions are to be feared in the event of fire.

ORDINARY HAZARD CONTENTS:
FUNDAMENTAL REQUIREMENTS: _____ building or structure, new or old, designed for _____ occupancy shall be provided with exits sufficient to permit the prompt escape of occupants in case of fire or other emergency. The design of _____ and other safeguards shall be such that reliance for _____ to life in case of fire or other emergency will _____ depend solely on any single safeguard; additional safeguards _____ be provided for life safety in case any single safeguard is ineffective due to some _____ or mechanical failure. _____ ___ building or structure shall be so constructed, arranged, equipped, maintained, and operated as to _____ undue danger to the lives and safety of its occupants from fire, smoke, fumes, or resulting _____ during the period of time reasonably necessary for _____ from the building or structure in case of fire or other emergency. _____ building or structure shall be provided with _____ of kinds, numbers, location, and capacity appropriate to the individual building or structure, with due regard to the character of the occupancy the _____ of _____ exposed, the fire protection available, and the height and type of construction of the building or structure, to afford _____ occupants convenient, facilities for escape. In _____ building or structure exits shall be so arranged and maintained as to provide _____ and _____ egress from all parts of the building or structure at _____ times when it is occupied. No _____ or fastening to prevent free _____ from the inside of any building shall be installed except in _____, _____ or _____ institutions where supervisory personnel is continually on duty and effective _____ are made to _____ occupants in case of _____ or _____ emergency. In _____ building or structure equipped for _____ illumination, adequate and reliable illumination _____ be provided for _____ exit facilities.

IPO 1.4 - DRAFTING

ORIENTATION, SAFETY & VICA

Complete the table at right with values from table G-1:

MATERIAL	CEILING VALUE (ppm)*
Benzyl chloride	_____
Doron oxide	_____
Carbon black	_____
Copper fume	_____
Cotton dust	_____
2,4-D	_____
DDT-Skin	_____
Endrin-Skin	_____
Formic acid	_____
Oxalic acid	_____
Rotenone	_____
Lead arsenate	_____
Iron oxide fume	_____

*ppm = parts per million

From table G-2 fill in the acceptable ceiling concentrations:

Benzine	_____	ppm
Carbon disulfide	_____	
Ethylene dibromide	_____	
Methyl chloride	_____	
Styrene	_____	
Hydrogen sulfide	_____	

IPO 1.6 - DRAFTING

ORIENTATION, SAFETY & VICA

VICA organization, history and purposes.
Circle the statements you believe are correct.

1. VICA is a national organization having as its parts clubs in all trade and industrial programs throughout the nation.

2. Florida VICA is a statewide organization which plans for state VICA contest finals every year.

3. The state VICA finals were held in Jacksonville in 1975.

4. The national VICA finals were held in Washington in 1975.

5. The Trade and Industrial Drafting Program at Englewood has been part of VICA for 12 years.

6. All of the students in Trade and Industrial Drafting are members of VICA.

7. VICA contests include architectural, mechanical and civil drafting.

8. Englewood VICA has been recognized by the Florida Crown Chapter of the American Society of Certified Engineering Technicians. By presentation of a plaque "Guest Speaker"

9. VICA contests are classified under 2 headings: 1. Capital, 2. Labor

10. Leadership contests in VICA are designed to improve your skill in Drafting.

11. Being a VICA member can help you:

    a. find a better job
    b. increase your number of friends
    c. keep from becoming bored
    d. learn to command attention as a speaker
    e. feel less nervous in public
    f. do your own thing
    g. learn to work efficiently as a member of a team

IPO 1.7 - PARTICIPATION

APPLICATION TO PARTICIPATE IN THE VICA SAFETY CONTEST:

NAME:_____ _____
Grade Sect. & No.

ADDRESS:_____
No. Street or Other

_____ _____ _____
City State Zip

_____
Social Security No.

My safety project is: (write full description below)

I am scheduled to have this project completed and ready to be judged by application of the VICA committee rating scale at the following time and date:

_____ _____ _____
Time Date Place

Signed:_____

TPO[illegible] - [illegible]

[illegible], [illegible] & [illegible]

Complete the following statements:

1. Twenty-six (26) degrees ammonia used for developing ozalid prints is a hazard to _____ for which reason safety _____ must be worn when refilling.

2. Five (5) sharp objects commonly used in drafting rooms which can cause serious injury resulting from "horseplay" by students are:

   (1)
   (2)
   (3)
   (4)
   (5)

3. Describe five (5) situations from which broken prescription eyeglasses can occur, dangerous to you or a classmate in the drafting shop.

4. Explain: "improper use of an electrical extension cord" applying to five (5) electrically energized tools or fixtures in a well-equipped drafting shop or office. List the five (5) tools or fixtures concerned.

5. Name and explain specific hazards:

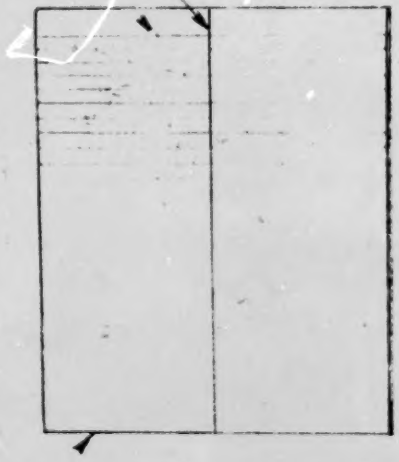
   (a) Two, electrical origin.
   (b) Two, chemical.
   (c) Two, recreational carelessness.
   (d) Two, common home origin.
   (e) Two, industrial origin.
   (f) Two, from improper use of power tools.

COURSE DRAFTING - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 2.0

SCALED DIMENSIONS

Given a summative written test requiring take-off dimensions with all scales of architects scale the learner will achieve a score of at least 80%.

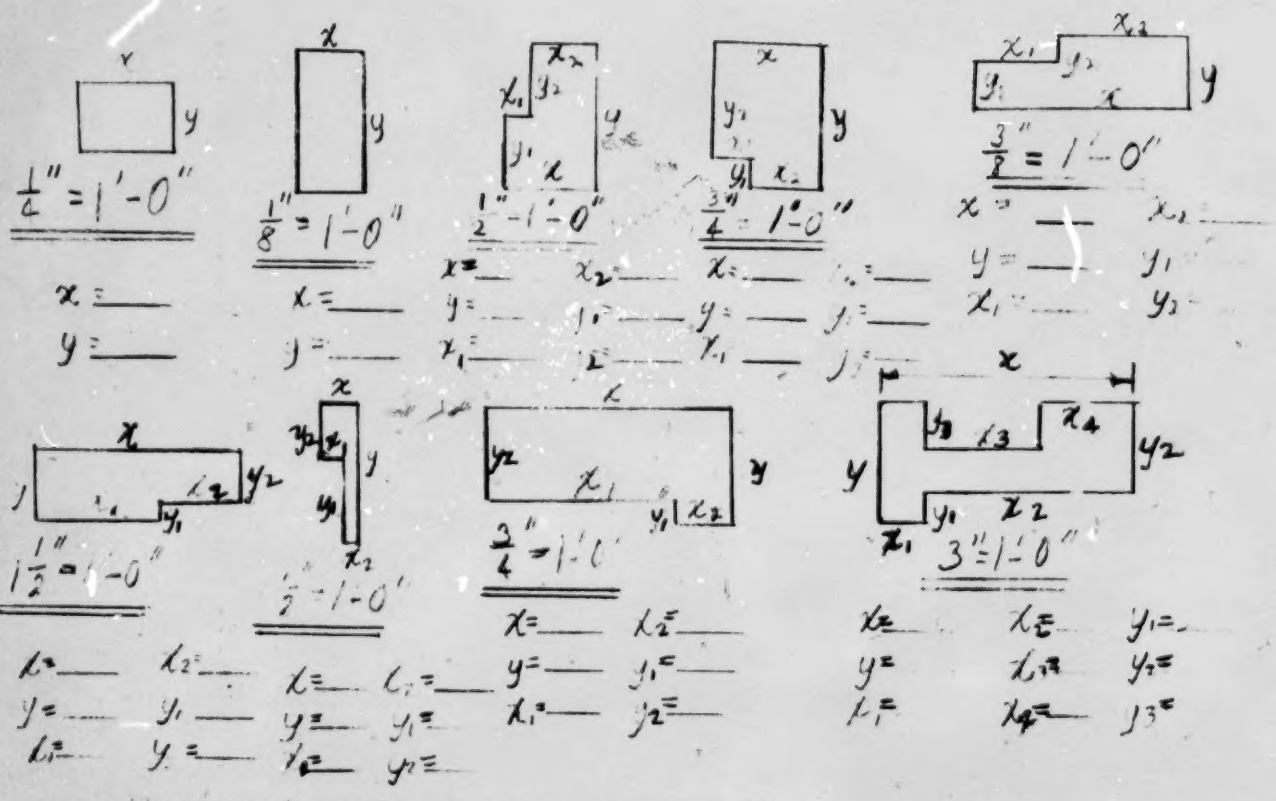
NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
		2.0	Test attached.
2.1	Given a blank sheet from stenographers notebook, a pencil and an architects scale, the learner will tick off 25 practice measurements in feet and inches called out by instructor. Tick marks shall be no more than 1" variation when checked applying for scale of 1/4" = 1'0". All students will attain a score of 80%.	2.1	Tickmarks — — Red line provides index for measurement  (SEE BELOW FOR INSTRUCTIONS) Blank page torn from steno pad
2.2	Given a blank sheet from stenographers notebook, a pencil and an architects scale, the learner will tick off 25 practice measurements in feet and inches called out by instructor. Tick marks shall be no more than 2 inch variation when checked applying for scale of 1/8" = 1'0". All students will attain a score of 80%.	2.2	Use right hand side of blank shown in IPO 2.1. INSTRUCTIONS: Using the red line in the center as an index, lay-off one dimension on each blue line starting on the top blue line. The instructor will call out each dimension once only and repeat each once only. After completing 25 practice dimensions on each side of the red line, connect tick marks vertically with a dotted line to prepare for a final check.

COURSE DRAFTING - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 2.0 (cont'd) SCALED DIMENSIONS

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
2.3	Given the criterion measure page from 2.1 and 2.2, the learner will determine a value for each distance measured from tick to tick across the red line using the 1/2" = 1'0" scale. The learner letters in each value so given to achieve a score of 20 out of 25 correct to the nearest 1/2".	2.3	Use results of 2.1 and 2.2 and complete operation by measuring from point to point across the red line on each blue line with the 1/2" = 1'0" scale and letter in each dimension so determined.

T: 2.0 Test, or Stud: Select the appropriate scale (s) on the Architects' scale; measure (take-Off) values for x and y. Write in each value in the space provided.



Above each scale notation shown below, draw a square correctly scaled according to the length of side given in each case.

3" = 1'-0" EACH SIDE 2"

3/4" 1'-0" EACH SIDE 11"

1/4" 1'-0" EACH SIDE 2 1/2"

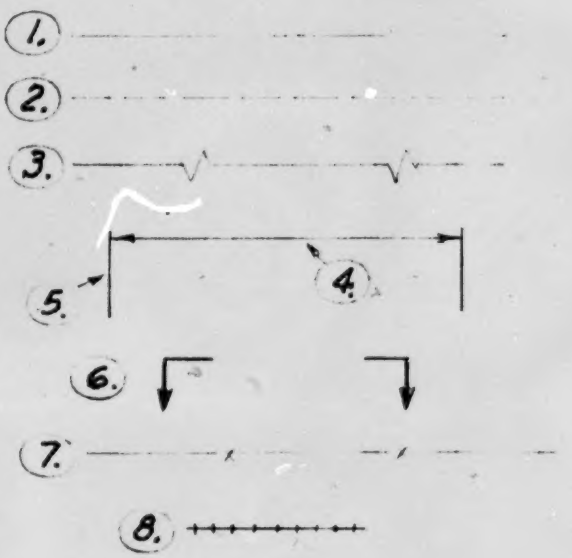
1 1/2" 1'-0" EACH SIDE 4"

COURSE DRAFTING - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 3.0 PENCIL LINEWORK

Given drafting format and equipment, the learner will complete a standard plate scoring at least points on a teacher-made rating scale.

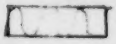
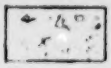
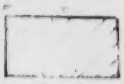
NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
		3.0	Rating Scale Attached with test.
3.1	Given a sheet with basic line and symbol illustrations. The student will identify each by selecting the names provided placing matching numbers in the spaces provided achieving 100% accuracy.	3.1	Place the appropriate number from the graphics below opposite names shown below. ____ Section cutting plane line ____ Centerline ____ Hidden line ____ Break line ____ Dimension line ____ Witness line ____ Railroad (small scale) ____ Fence



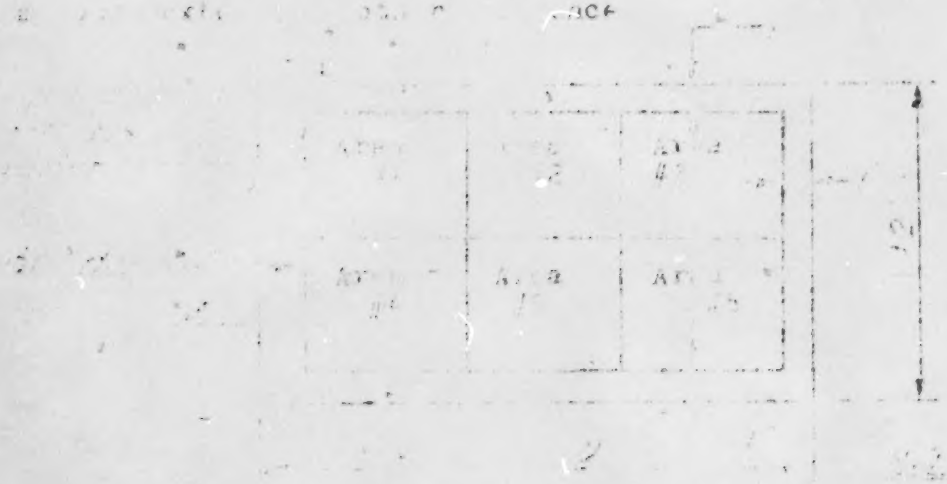
COURSE DRAFTING - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 3.0 (cont'd) PENCIL LINEWORK

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
3.2	Given a series of symbols and conventions, the learner identifies each by selecting the verbal equivalent of each and placing the appropriate number in the space provided indicating "elevation" or "section" in appropriate column.	3.2	Select name of symbol below. Place appropriate number and check mark indicating whether "in section" or "in elevation".

SYMBOL	NUMBER	SECTION	ELEVATION
	____	____	____
	____	____	____
	____	____	____
	____	____	____
	____	____	____
	____	____	____
	____	____	____
	____	____	____
	____	____	____
	____	____	____
	____	____	____

1. Steel
2. Masonry
3. Brick Veneer
4. Insulation
5. Brick
6. Rough lumber
7. Concrete
8. Earth
9. Glass (elev.)
10. Glass
11. Finished lumber



STUDENT _____

DATE _____

TPO 3.0 - DRAFTING

PENCIL LINEWORK

RATING SCALE

1. unacceptable
2. needs improvement
3. acceptable
4. excellent

1. Alphabet of lines _____
2. Spacing of lines _____
3. Weight of lines _____
4. Corners & meetings _____
5. Trueness of lines _____
6. Lettering _____
7. Format _____
8. Overall appearance _____

Recycle those scoring 16 and below.

COURSE DRAFTING - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 4.0 OBJECT DRAWING ARCS & TANGENTS

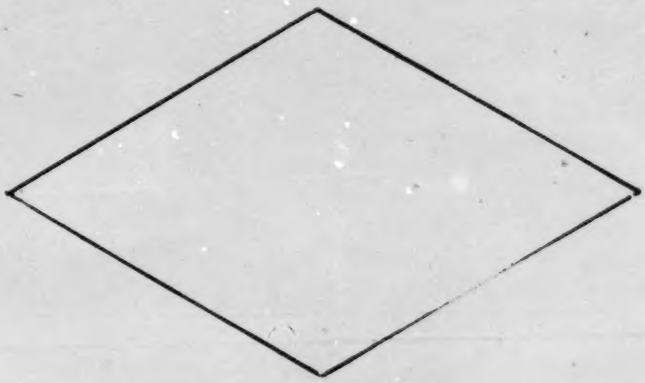
The learner will complete a written test calling for pencil drawings of views of swimming pools, furniture and matching parts with an accuracy of 80%.

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
		4.0	See attached test.
4.1	Given a circle and an external point, the learner draws a line from the point to a tangent point on the circle. Clearly showing how the tangent point is located.	4.1	From point "A" draw a line tangent to the given circle terminating at the point of tangency. Show how you locate the exact point of tangency.

A

COURSE DRAFTING - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 4.0 (cont'd) OBJECT DRAWING ARCS & TANGENTS

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
4.2	Given a diamond shape drawn to scale, the learner locates the appropriate centers and accurately draws specified radius corners showing method of locating all centers and all tangent points to score at least 80%.	4.2	In the diamond shape below accurately draw to the scale of 1/2" = 1'0" 6" radius corners at the acute angle corners and 18" radius corners at the obtuse angle corners. Show with light lines the necessary construction to determine the radius centers and the tangent points. 

TPO 4.0 - DRAFTING - BASIC

OBJECT DRAWING ARCS & TANGENTS

1. Draw swimming pool plan views: 10 flat ovals to the scale of 1/8" = 1'0".

   a. 10' x 15'
   b. 20' x 25'
   c. 7' x 14'
   d. 12' x 22'
   e. 9' x 12'
   f. 7' x 30'
   g. 5' x 20'
   h. 5' x 35'
   i. 15' x 20'
   j. 3' x 17'

2. Draw 5 rectangular table tops plan view, scale 1/4" = 1'0".

   a. 4' x 4', 6" r. corners
   b. 6' x 3', 8" r. corners
   c. 7' x 2', 7" r. corners
   d. 3' x 4', 10" r. corners
   e. 7' x 9', 6" r. corners

3. Draw 5 kidney shaped pools, scale 1/8" = 1'0".

R_1	R_2	R_3	R_4
10	5	20	5
6	5	16	5
14	6	26	6
10	8	to suit	7
8	4	to suit	7

4. Draw 2 diamond shaped pools.

R_1	R_2	L	D
6	10	30	60°
10	20	40	30°

COURSE DRAFTING - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 5.0

COORDINATE GEOMETRY AND MODEL DEVELOPMENT

The learner will complete 3 orthographic projections and will complete models for each with 80% accuracy.

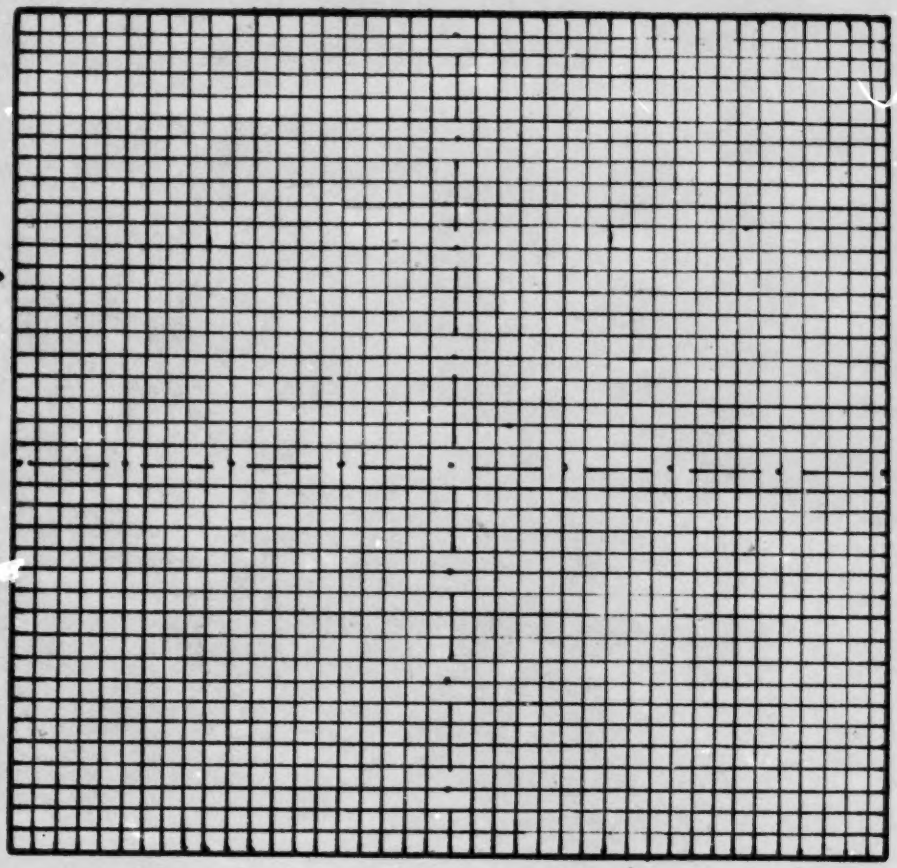
NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
		5.0	Test attached.
5.1	Given a problem on coordinate sheet locating, by means of 3-dimensional coordinates, a series of 10 points, the learner will plot and label correctly 3 views of each point successfully 100% accuracy.	5.1	Plot the coordinates shown below on standard grid format attached. a. 3,7,4 b. 2,5,10 c. 7,2,2 d. 4,9,4 e. 7,7,7 f. 3,7,7 g. 7,5,2 h. 3,9,6 i. 6,5,4 j. 1,10,1
5.2	Given a series of 10 problems on coordinate sheets locating points in three dimensions sufficient to define various geometric solids, the learner will complete the three views of all achieving 80% minimum rating.	5.2	See coordinate problem sheet attached.

COURSE DRAFTING - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 5.0 (cont'd) COORDINATE GEOMETRY AND MODEL DEVELOPMENT

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
5.3	Given coordinates defining a triangular surface, the learner determines the true lengths of 3 sides and makes the triangular surface from cardboard, to the accuracy 1/16"± each side.	5.3	Plot the coordinates on attached standard 1/8" gridded format and develop the true surface of the triangular surface defined.

5.1



- STANDARD FORMAT -
COORDINATE GEOMETRY

A. __ __ __

B. __ __ __

C. __ __ __

D. __ __ __

E. __ __ __

F. __ __ __

G. __ __ __

H. __ __ __

M. __ __ __

N. __ __ __

O. __ __ __

P. __ __ __

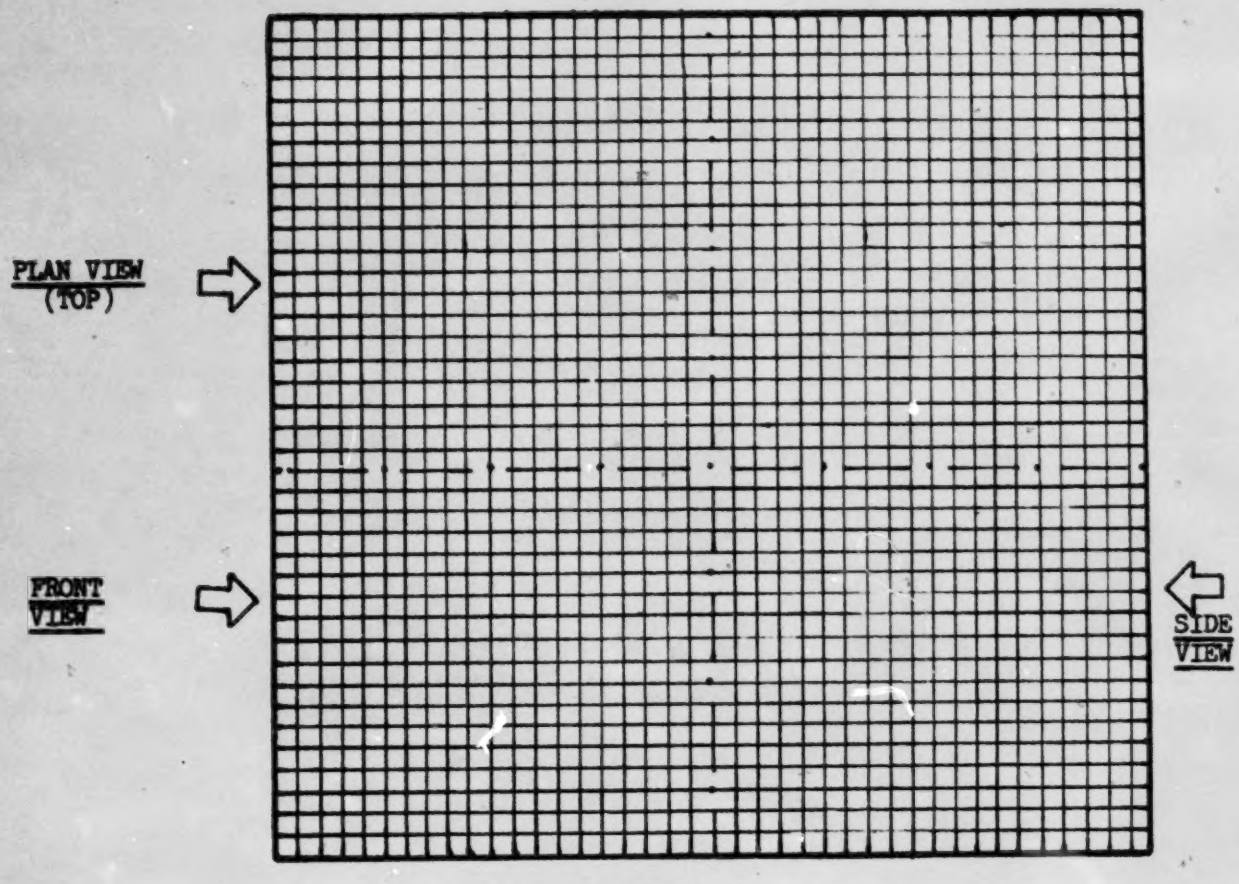
Q. __ __ __

R. __ __ __

S. __ __ __

T. __ __ __

5.2 (#2)



- STANDARD FORMAT -
COORDINATE GEOMETRY

A. 8 2 2

B. 8 14 2

C. 3 2 5

D. 3 14 5

E. 13 2 5

F. 13 14 5

G. 3 2 11

H. 3 14 11

J. 13 2 11

K. 13 14 11

M. ___ ___ ___

N. ___ ___ ___

O. ___ ___ ___

P. ___ ___ ___

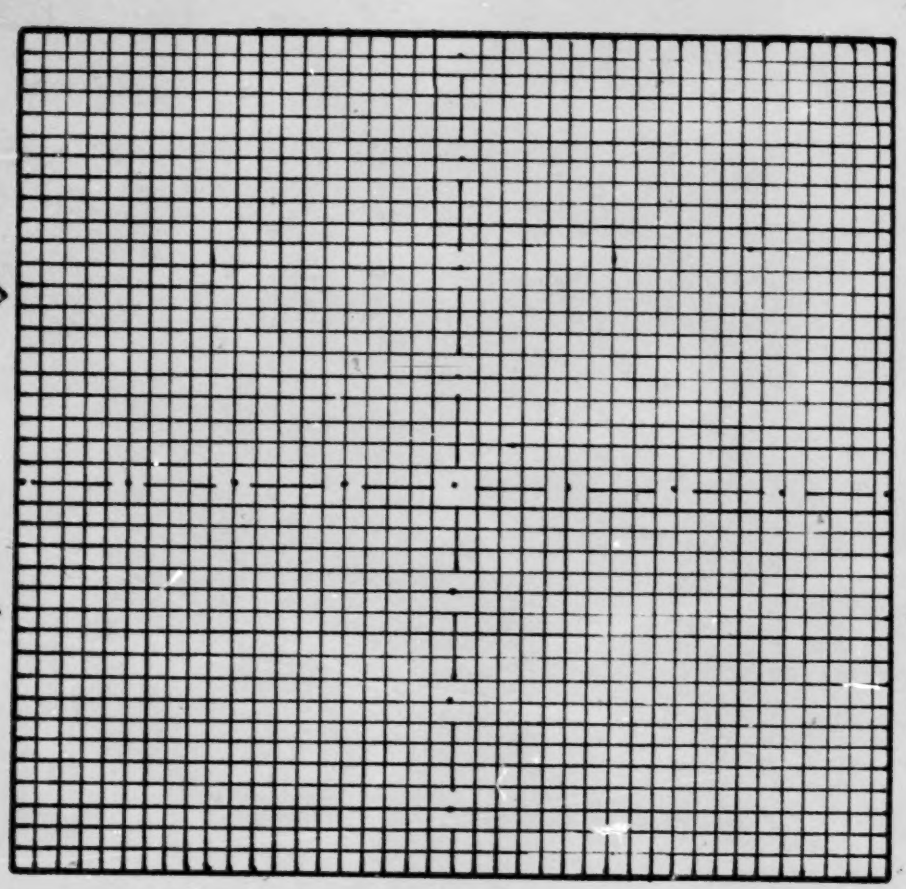
Q. ___ ___ ___

R. ___ ___ ___

S. ___ ___ ___

T. ___ ___ ___

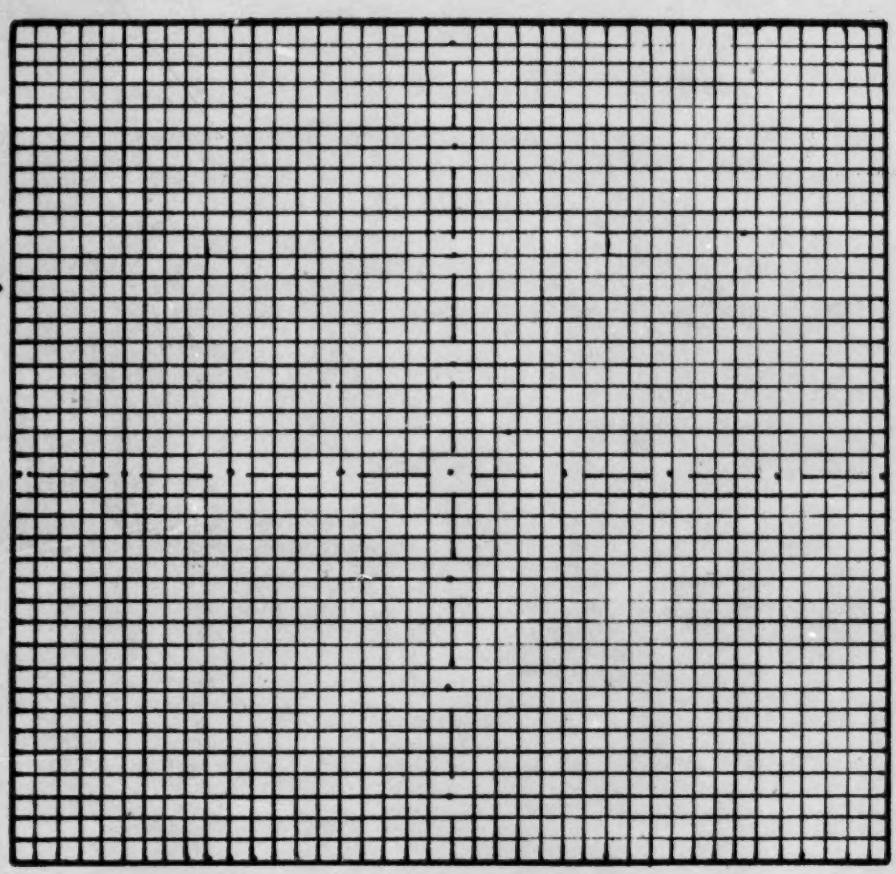
5.2 (#1)



- STANDARD FORMAT -
COORDINATE GEOMETRY

A.	2	2	10	M.	___ ___ ___
B.	8	2	10	N.	___ ___ ___
C.	8	8	10	O.	___ ___ ___
D.	2	8	10	P.	___ ___ ___
E.	5	5	2	Q.	___ ___ ___
F.	___	___	___	R.	___ ___ ___
G.	___	___	___	S.	___ ___ ___
H.	___	___	___	T.	___ ___ ___

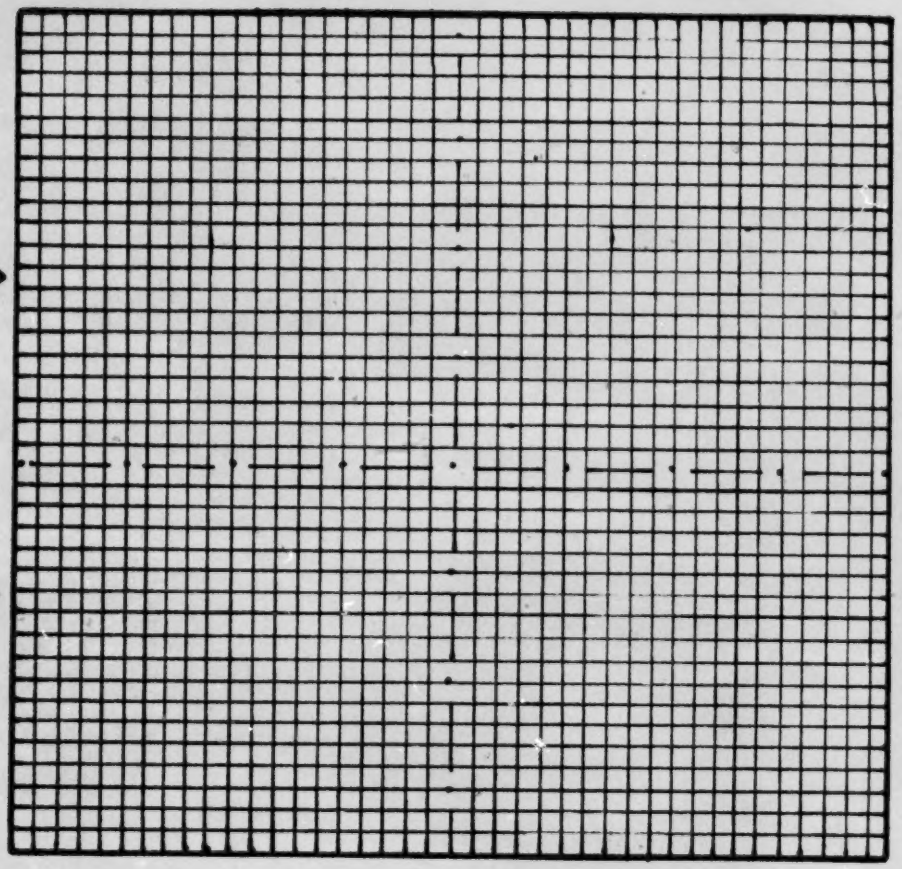
5.2 (#3)



- STANDARD FORMAT -
COORDINATE GEOMETRY

A.	9	7	2	M.	_ _ _
B.	9	11	2	N.	_ _ _
C.	3	1	5	O.	_ _ _
D.	3	17	5	P.	_ _ _
E.	15	1	5	Q.	_ _ _
F.	15	17	5	R.	_ _ _
G.	_	_	_	S.	_ _ _
H.	_	_	_	T.	_ _ _

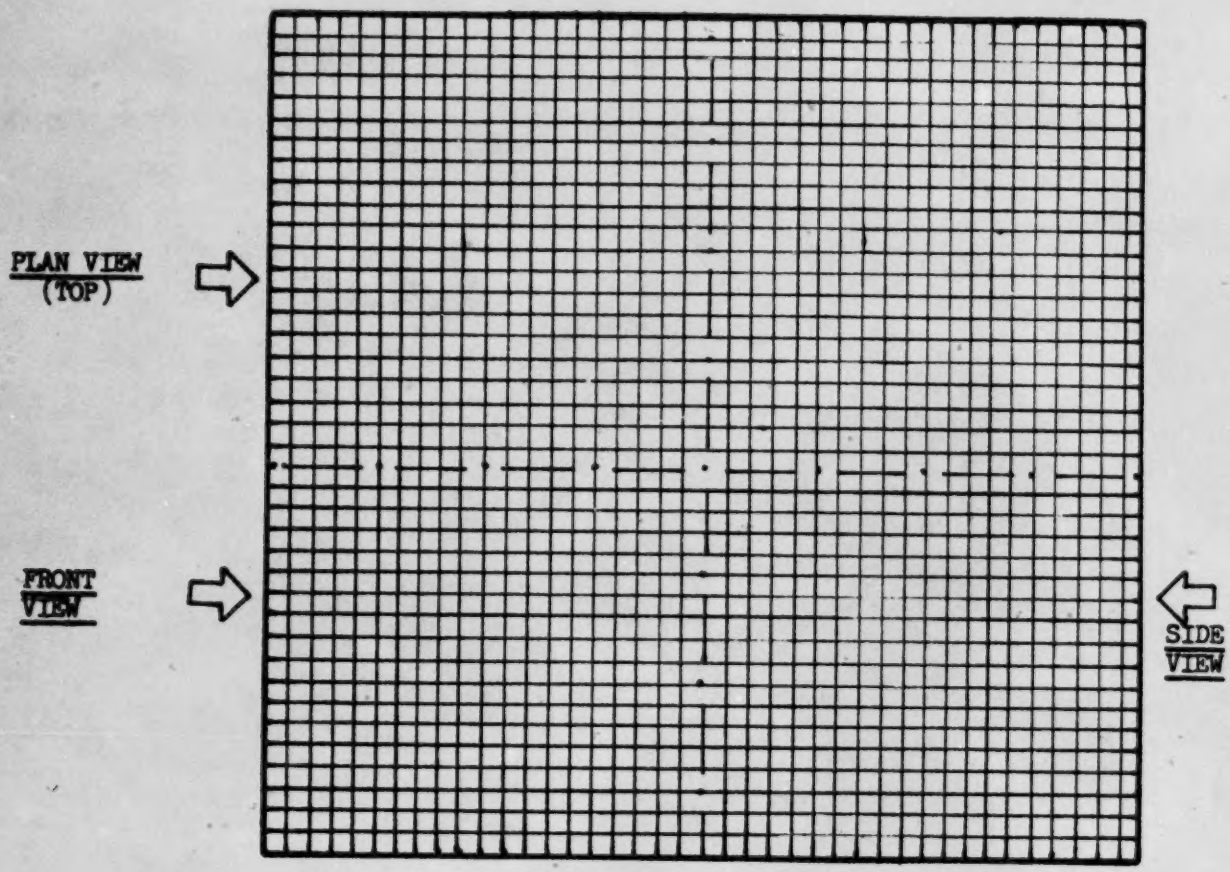
5.2 (#4)



- STANDARD FORMAT -
COORDINATE GEOMETRY

A.	10	9	1		M.	4	3	2
B.					N.	4	15	2
C.					O.	16	3	2
D.					P.	16	15	2
E.					Q.	2	1	5
F.					R.	2	17	5
G.					S.	18	1	5
H.					T.	18	17	5

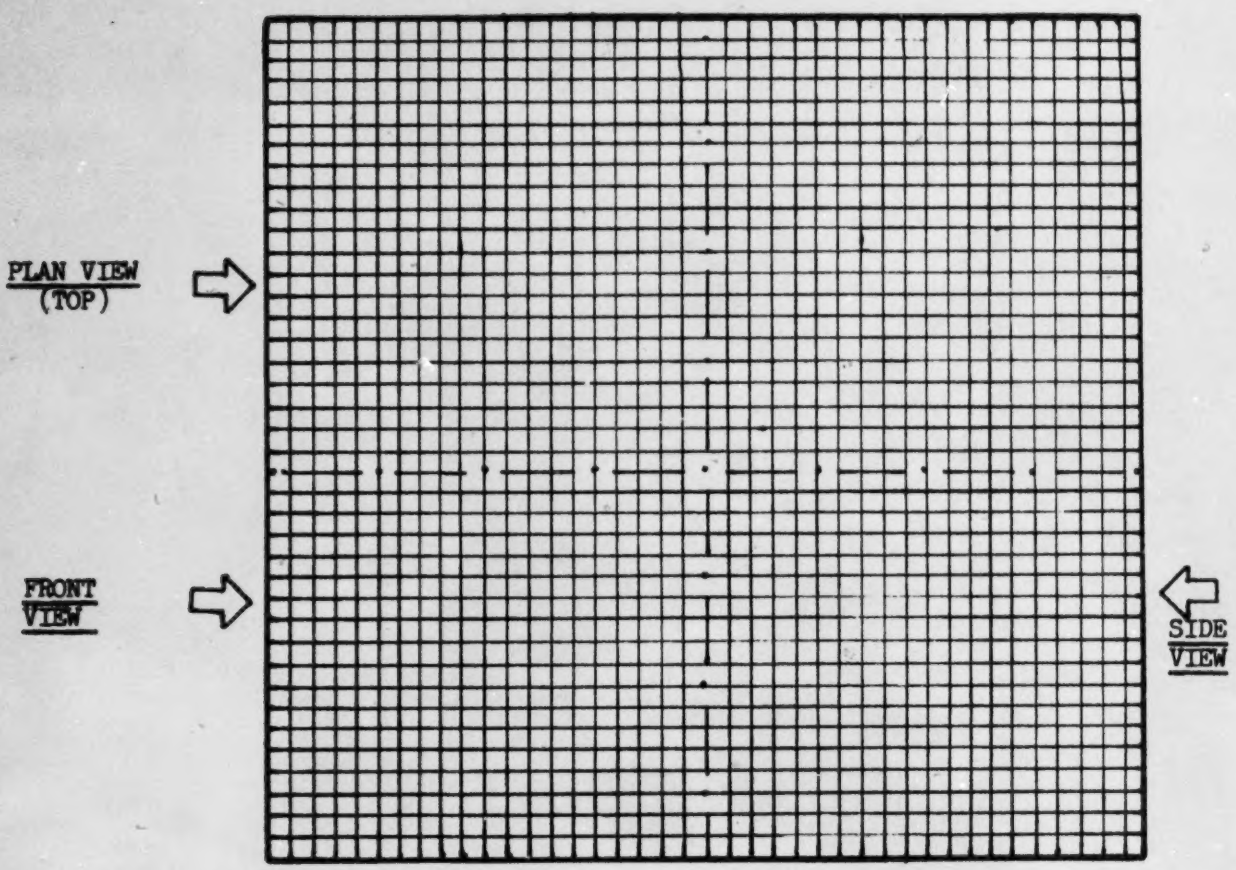
5.2 (#5)



- STANDARD FORMAT -
COORDINATE GEOMETRY

A.	8	8	1	M.	___ ___ ___
B.	2	2	12	N.	___ ___ ___
C.	9	14	14	O.	___ ___ ___
D.	12	3	8	P.	___ ___ ___
E.	___	___	___	Q.	___ ___ ___
F.	___	___	___	R.	___ ___ ___
G.	___	___	___	S.	___ ___ ___
H.	___	___	___	T.	___ ___ ___

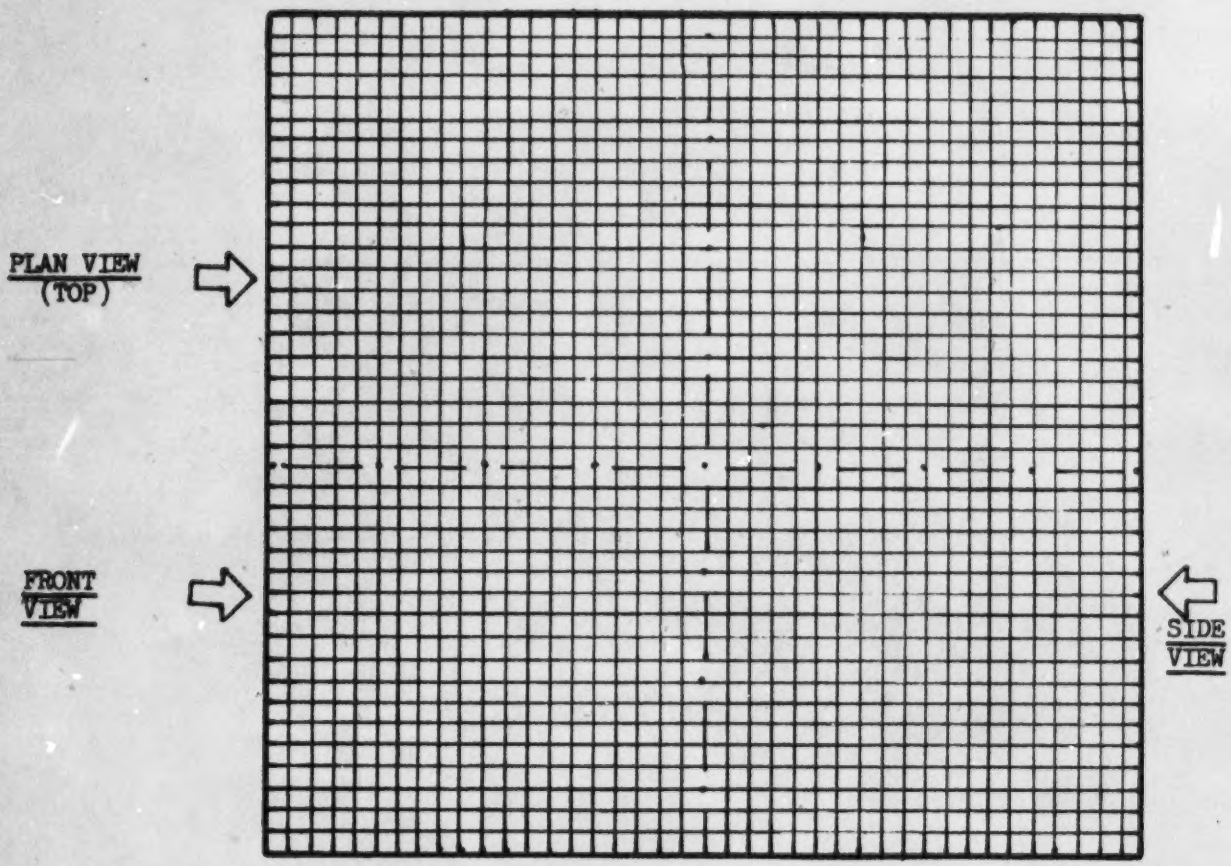
5.2 (#6)



- STANDARD FORMAT -
COORDINATE GEOMETRY

A.	8	8	1	M.	___ ___ ___
B.	2	2	12	N.	___ ___ ___
C.	9	14	14	O.	___ ___ ___
D.	12	3	8	P.	___ ___ ___
E.	15	10	4	Q.	___ ___ ___
F.	___	___	___	R.	___ ___ ___
G.	___	___	___	S.	___ ___ ___
H.	___	___	___	T.	___ ___ ___

5.2 (#6)



- STANDARD FORMAT -
COORDINATE GEOMETRY

A. 1 8 2

B. 16 8 2

C. 1 2 8

D. 16 2 8

E. 1 14 8

F. 16 14 8

G. 1 8 14

H. 14 8 14

M. 7 1 2

N. 7 16 2

O. 2 1 8

P. 2 16 8

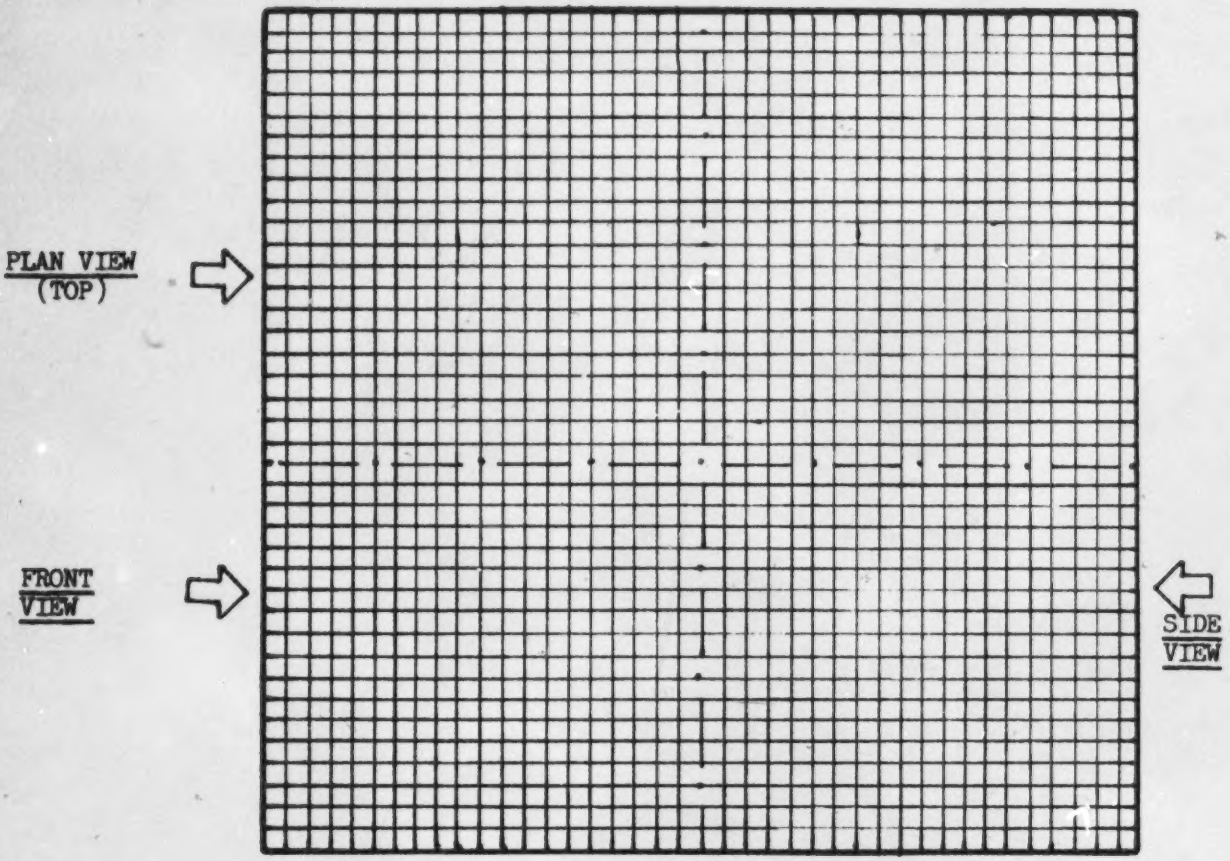
Q. 7 1 12

R. 7 16 12

S. 11 1 8

T. 11 16 8

5.2 (# 7)



- STANDARD FORMAT -
COORDINATE GEOMETRY

A. 1 8 2

B. 16 8 2

C. 1 2 8

D. 16 2 8

E. 1 14 8

F. 16 14 8

G. 1 8 14

H. 14 8 14

M. 5 1 2

N. 5 16 2

O. 2 1 8

P. 2 16 8

Q. 5 1 12

R. 5 16 12

S. 11 1 8

T. 11 16 8

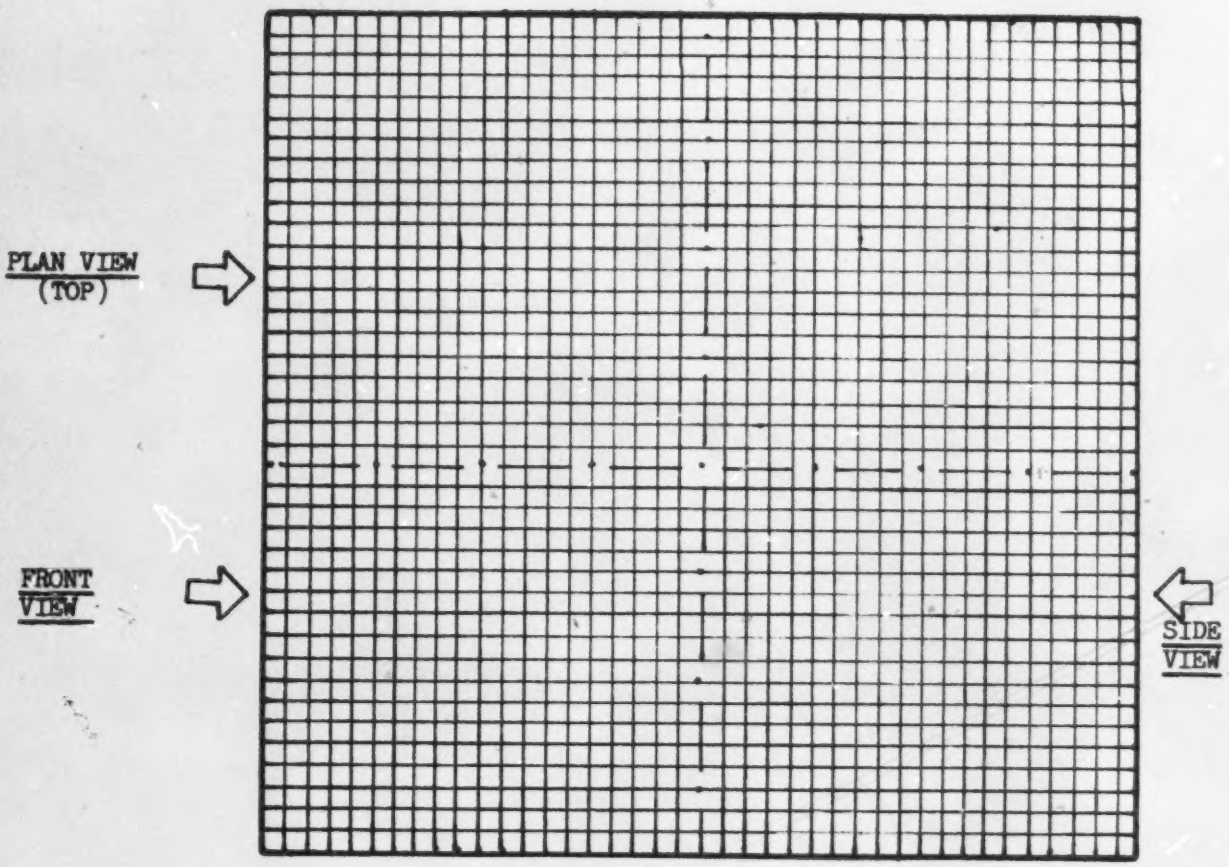
U 9 1 2

V. 9 16 2

W. 9 1 12

X. 9 16 12

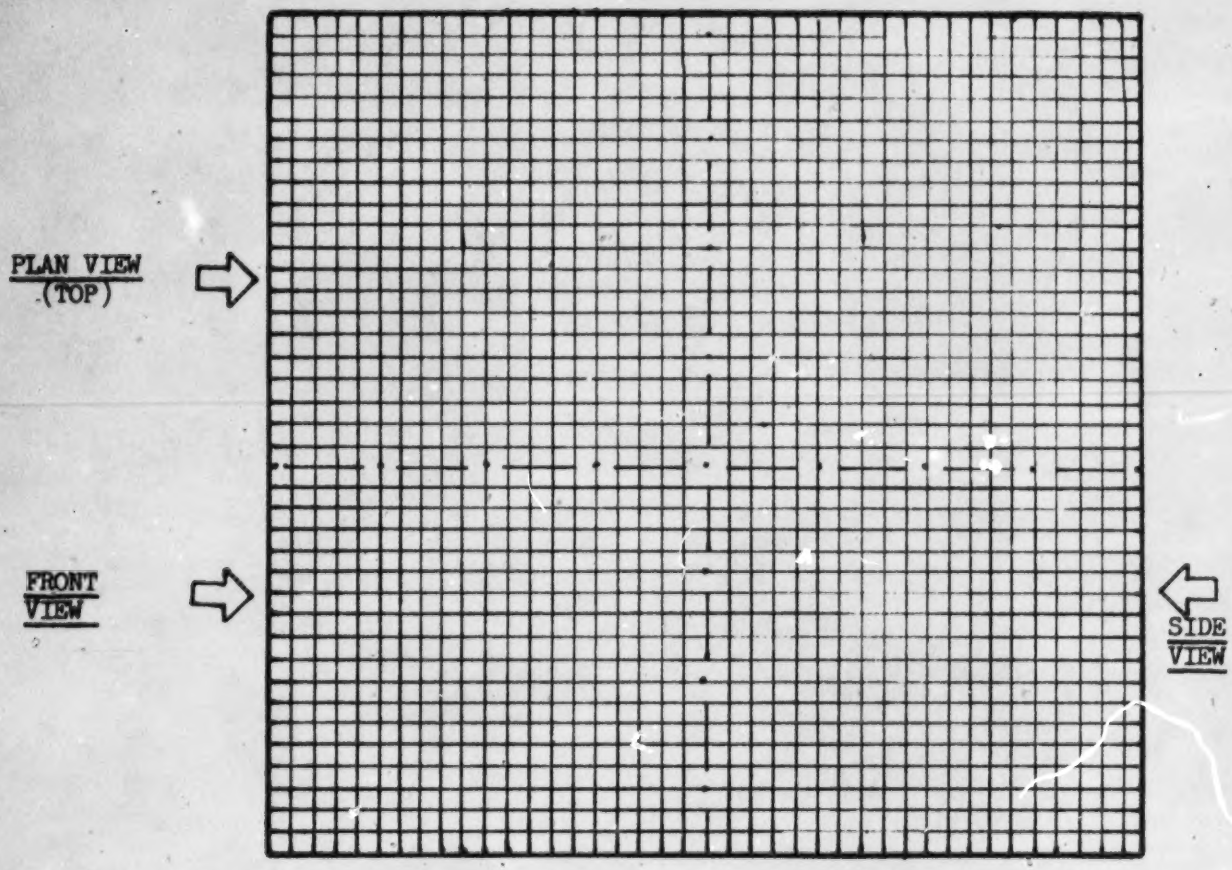
5.2 (#2)



- STANDARD FORMAT -
COORDINATE GEOMETRY

A.	1	8	2		M.	7	1	2
B.	16	8	2		N.	7	16	2
C.	1	2	8		O.	3	1	11
D.	16	2	8		P.	3	16	11
E.	1	14	8		Q.	11	1	11
F.	16	14	8		R.	11	16	11
G.	1	8	14		S.			
H.	14	8	14		T.			

5.2 (#9)



- STANDARD FORMAT -
COORDINATE GEOMETRY

A. 1 8 2

B. 16 8 2

C. 1 2 8

D. 16 2 8

E. 1 14 8

F. 16 14 8

G. 1 8 14

H. 14 8 14

M. 11 5 1

N. 3 16 16

O. 14 2 3

P. 6 13 18

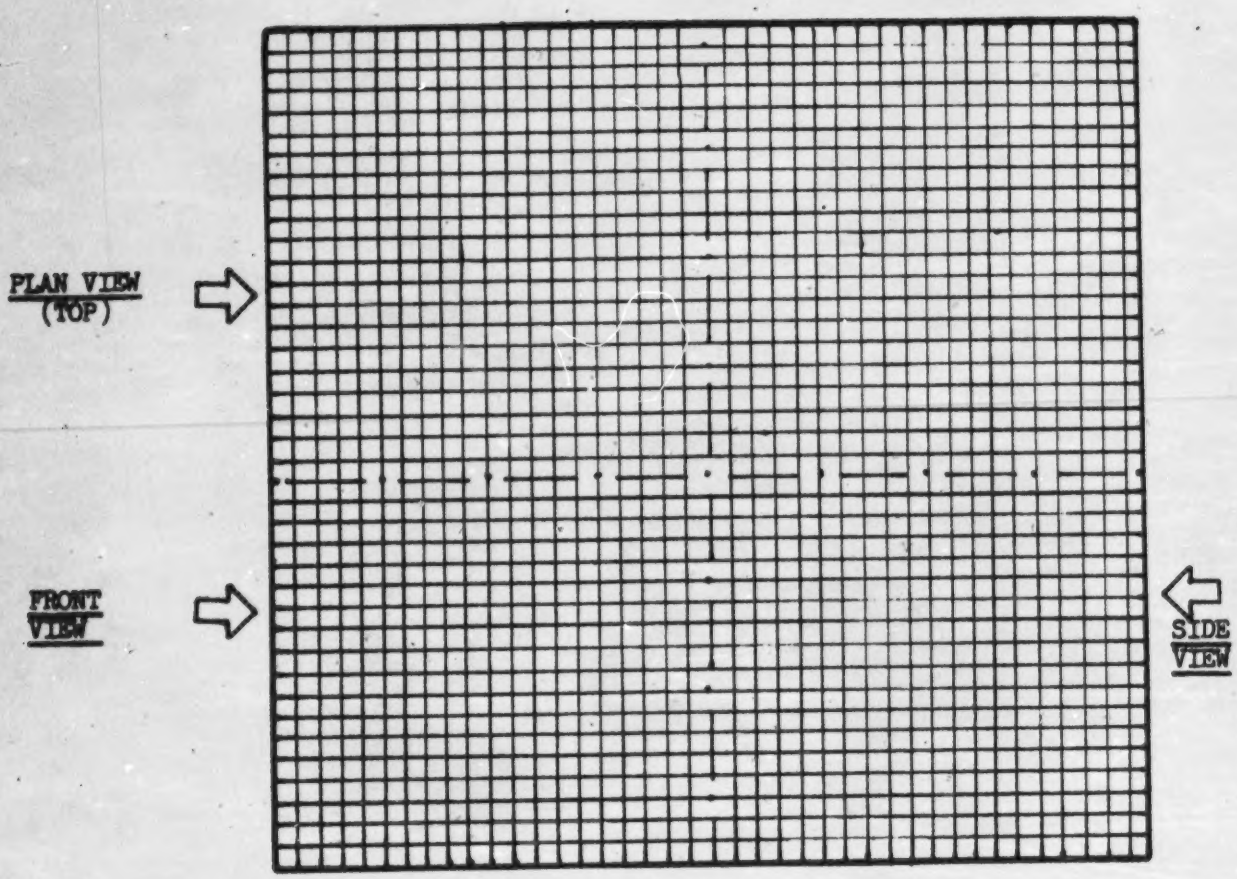
Q. ___ ___ ___

R. ___ ___ ___

S. ___ ___ ___

T. ___ ___ ___

5.2 (#10)



- STANDARD FORMAT -
COORDINATE GEOMETRY

A. 1 8 2

B. 16 8 2

C. 1 2 8

D. 16 2 8

E. 1 14 8

F. 16 14 8

G. 1 8 14

H. 14 8 14

M. 11 5 1

N. 3 16 16

O. 14 2 3

P. 6 13 18

Q. 17 3 1

R. 9 14 16

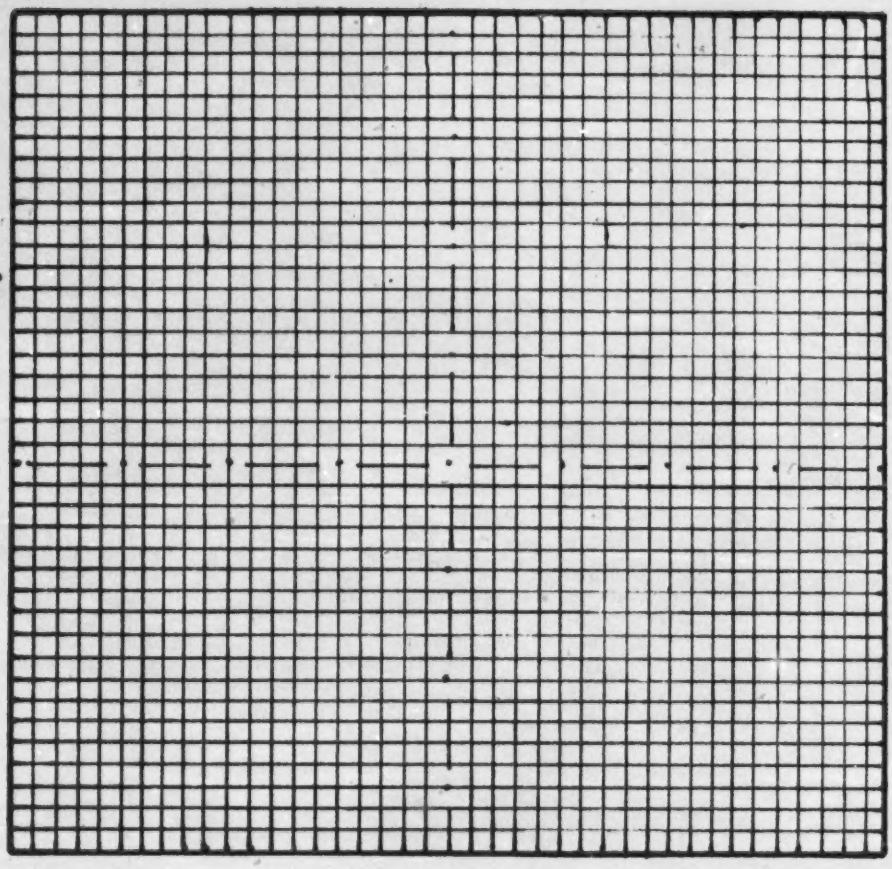
S. ___ ___ ___

T. ___ ___ ___

TEST 5.3

PLAN VIEW (TOP)

FRONT VIEW



SIDE VIEW

- STANDARD FORMAT -
COORDINATE GEOMETRY

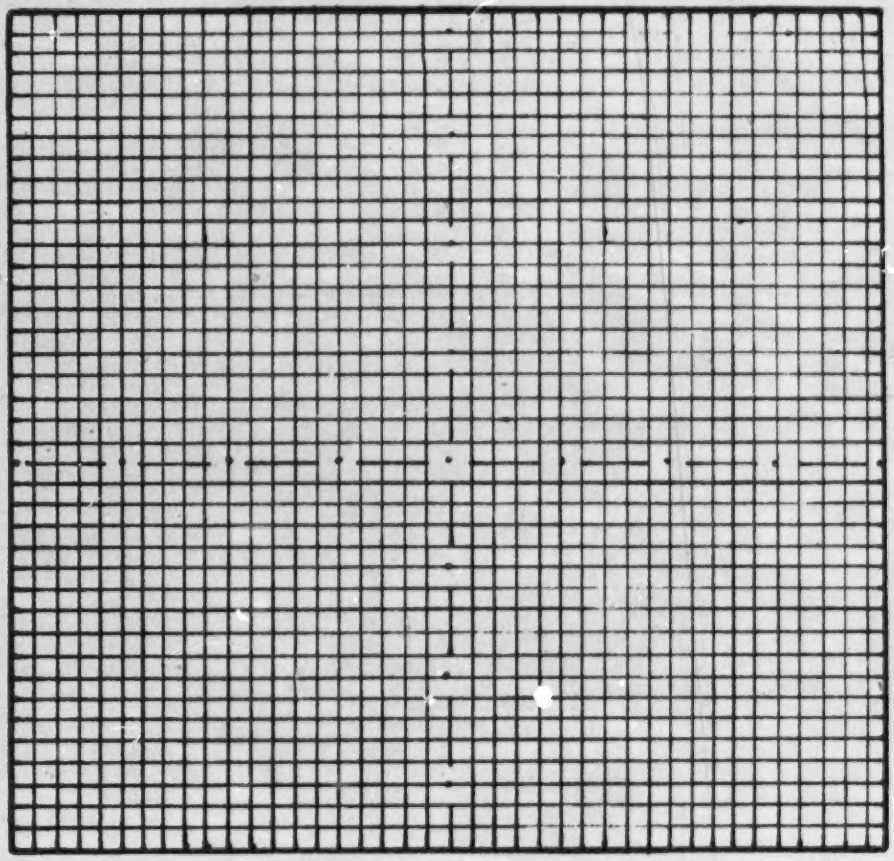
A.	5	2	3	M.	___ ___ ___
B.	17	7	3	N.	___ ___ ___
C.	14	14	14	O.	___ ___ ___
D.	___	___	___	P.	___ ___ ___
E.	___	___	___	Q.	___ ___ ___
F.	___	___	___	R.	___ ___ ___
G.	___	___	___	S.	___ ___ ___
H.	___	___	___	T.	___ ___ ___

TPO-5.0-TEST-PLATE #1: PLOT, DRAW, AND MAKE MODELS OF THE INTERSECTING PRISMS DEFINED BY THE CO-ORDINATES GIVEN BELOW.

PLAN VIEW (TOP)

FRONT VIEW

SIDE VIEW



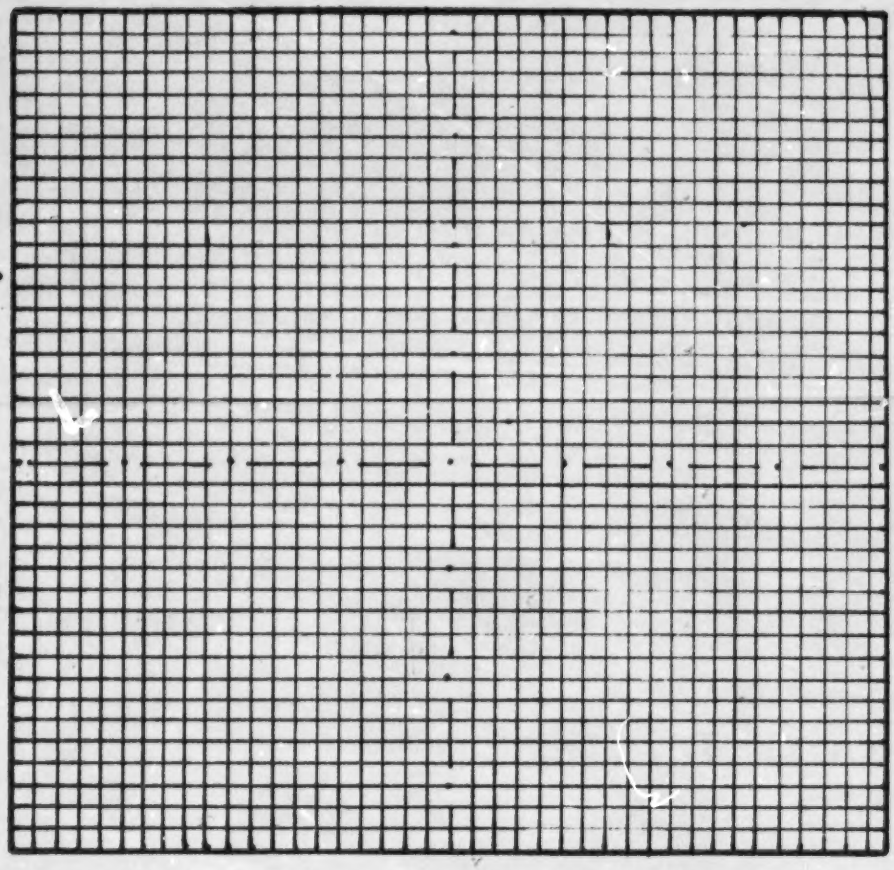
- STANDARD FORMAT -
COORDINATE GEOMETRY

A.	1	8	2	M.	7	1	2
B.	16	8	2	N.	7	16	2
C.	1	2	8	O.	2	1	8
D.	16	2	8	P.	2	16	8
E.	1	14	8	Q.	7	1	12
F.	16	14	8	R.	7	16	12
G.	1	8	14	S.	11	1	8
H.	16	8	14	T.	11	16	8

TPC 5.0 -- TEST-PLATE #2: PLOT, DRAW, AND MAKE MODELS OF THE INTERSECTING PRISMS DEFINED BY THE CO-ORDINATES GIVEN BELOW.

PLAN VIEW (TOP)

FRONT VIEW



SIDE VIEW

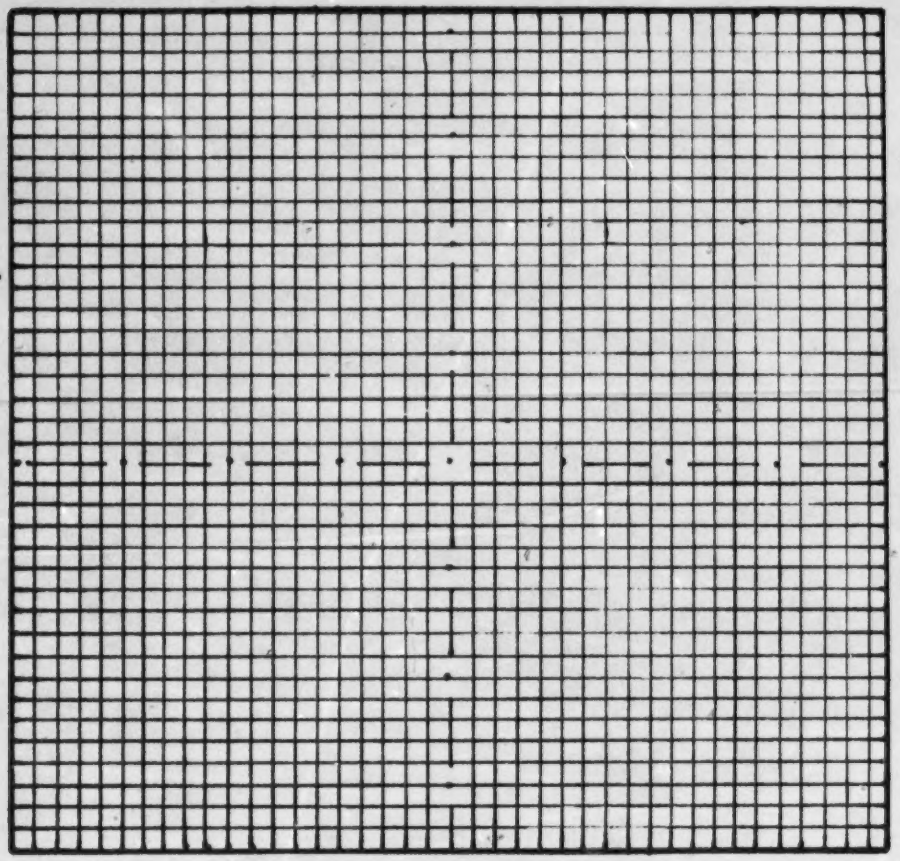
- STANDARD FORMAT -
COORDINATE GEOMETRY

A.	1	8	2	M.	5	1	2	u.	9	1	2
B.	16	8	2	N.	5	16	2	v.	9	16	2
C.	1	2	8	O.	2	1	8	w	9	1	12
D.	16	2	8	P.	2	16	8	x.	9	16	12
E.	1	14	8	Q.	5	1	12				
F.	16	14	8	R.	5	16	12				
G.	1	8	14	S.	11	1	8				
H.	16	8	14	T.	11	16	8				

5.0 TEST- PLATE # 3: PLOT, DRAW, AND MAKE MODELS OF THE INTERSECTING PRISMS DEFINED BY THE CO-ORDINATES GIVEN BELOW.

PLAN VIEW (TOP) ⇨

FRONT VIEW ⇨



⇦ SIDE VIEW

- STANDARD FORMAT -
COORDINATE GEOMETRY

A.	1	8	2	M.	7	1	2
B.	16	8	2	N.	7	16	2
C.	1	2	8	O.	3	1	11
D.	16	2	8	P.	3	16	11
E.	1	14	8	Q.	11	1	11
F.	16	14	8	R.	11	16	11
G.	1	8	14	S.			
H.	16	8	14	T.			

COURSE DRAFTING - BASIC

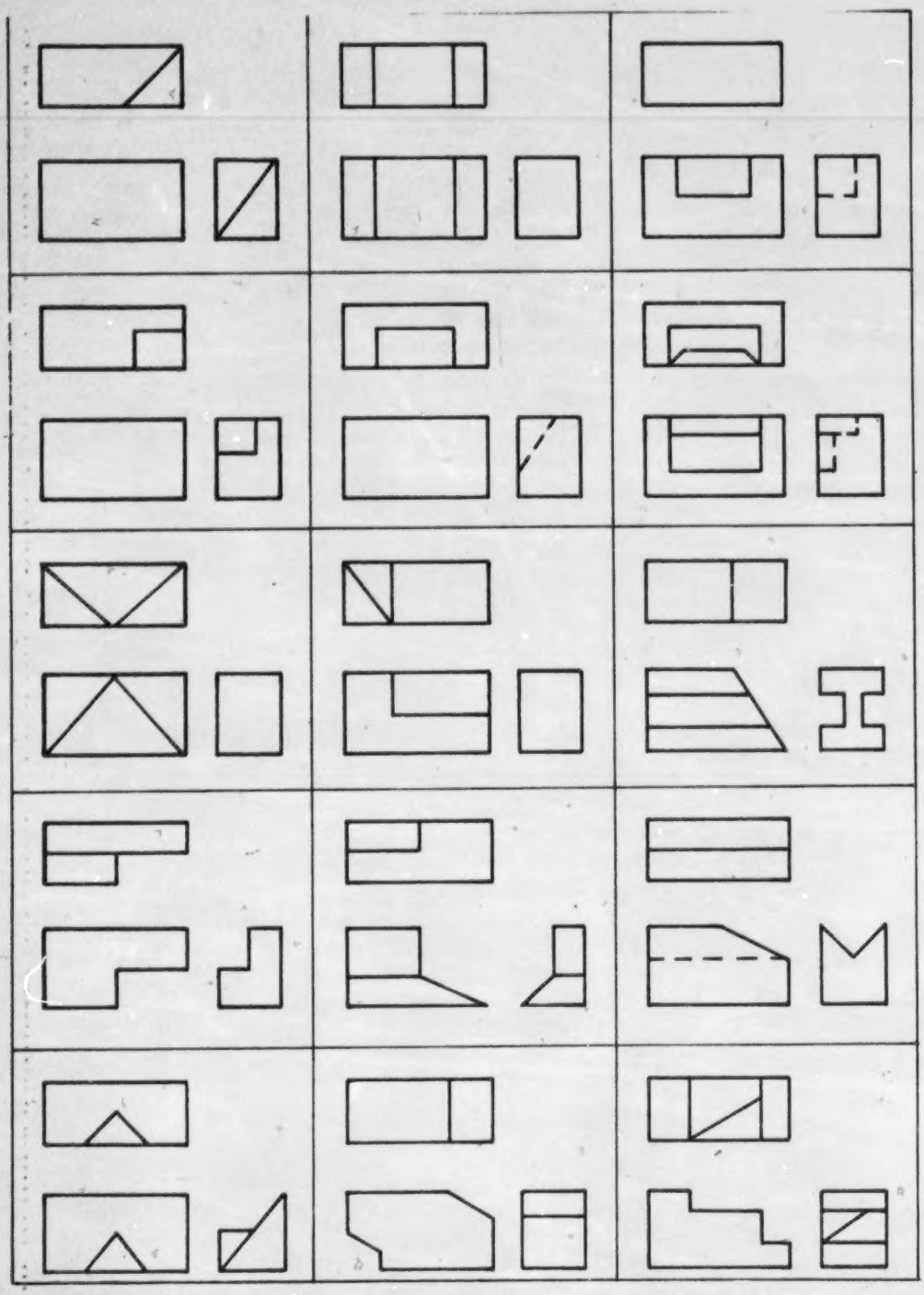
TERMINAL PERFORMANCE OBJECTIVE NO. 6.0

MULTI-VIEW/ISOMETRIC ASSOCIATE DEVELOPMENT

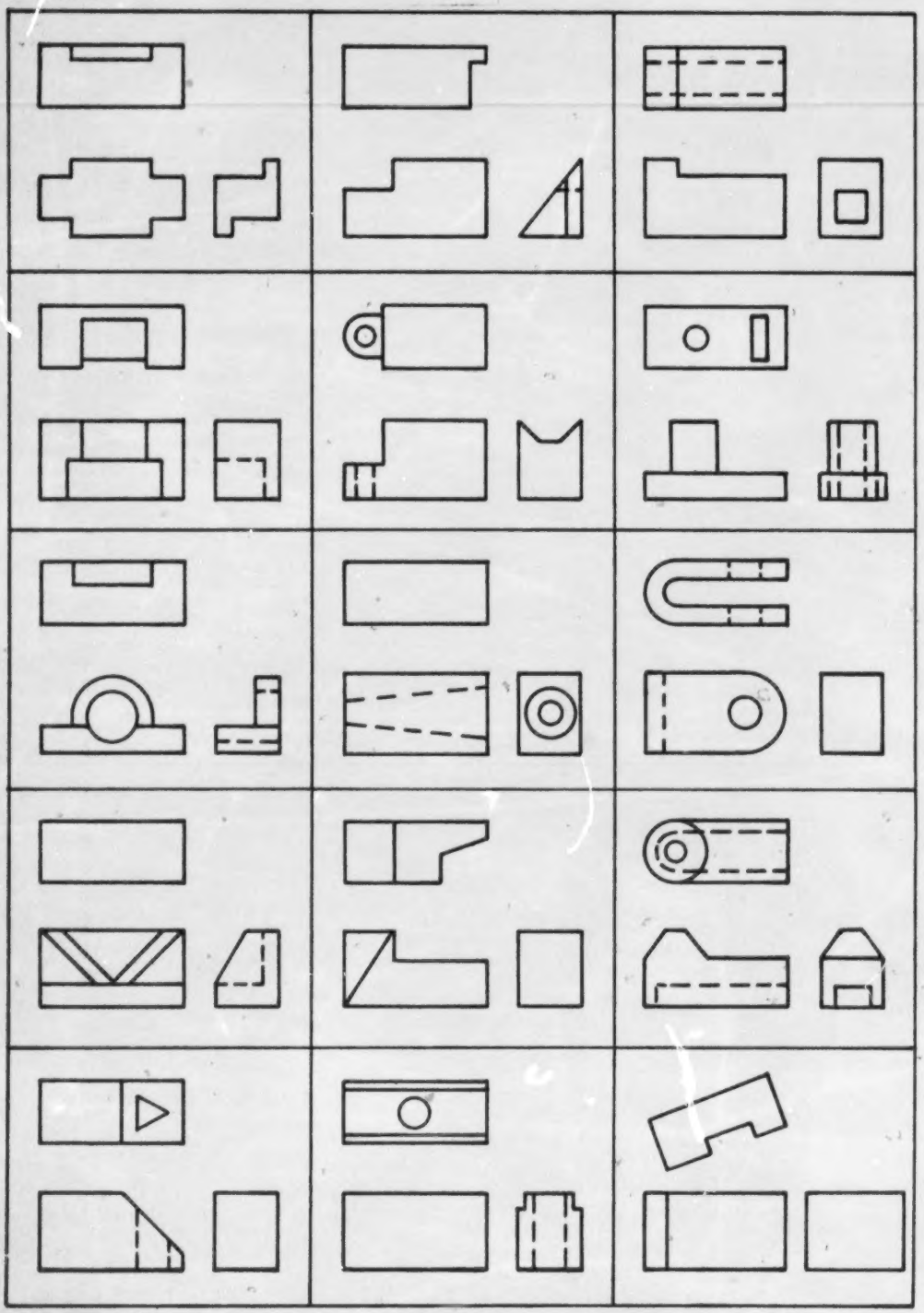
Given drawing problems with unfinished views, the learner will complete the unfinished views and will make isometric views showing all completed surfaces with 80% accuracy.

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
		6.0	See attached test.
6.1	Given an assignment of 15 problems in the test book, the learner will prepare a tracing on 18 x 12 format duplicating the problem; adding an isometric insert and correctly completing all views placing corresponding numbers on corresponding surfaces. RATING SCALE: Geometry 40% Composition 20% Lettering 20% Accuracy 10% Neatness 10% POSSIBLE 100%	6.1	See attached test.
6.2	Identical to 6.1 except 15 problems are advanced to geometry. A score of 70% will be considered passing.	6.2	See attached test.

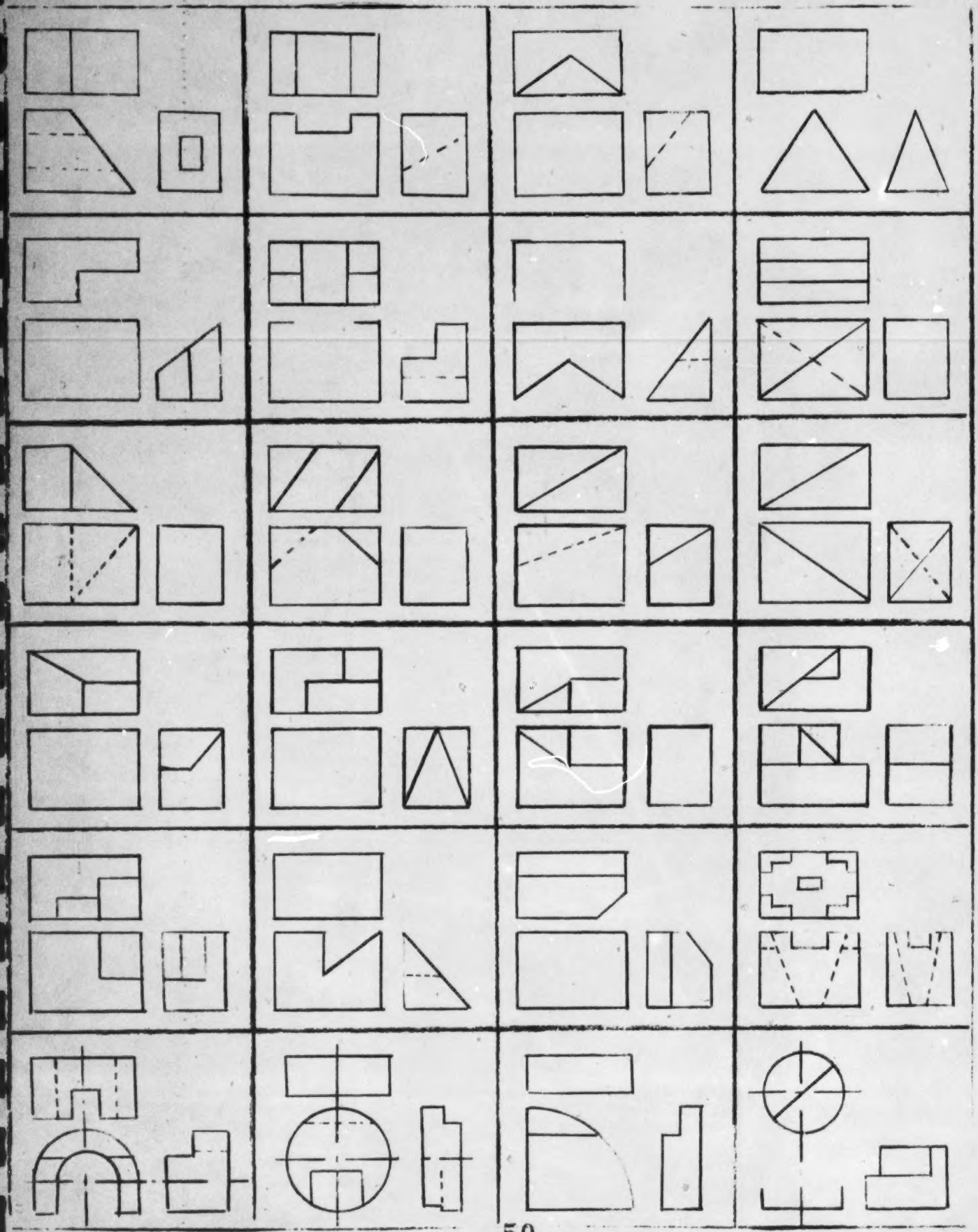
IPC 6.1-Test, drafting: Duplicate all problems on standard format 12x18 tracing sheet; develop an isometric inset for each problem showing all surfaces in the multiview on your isometric. Complete all three views of each problem so that all views agree to define a geometric solid.



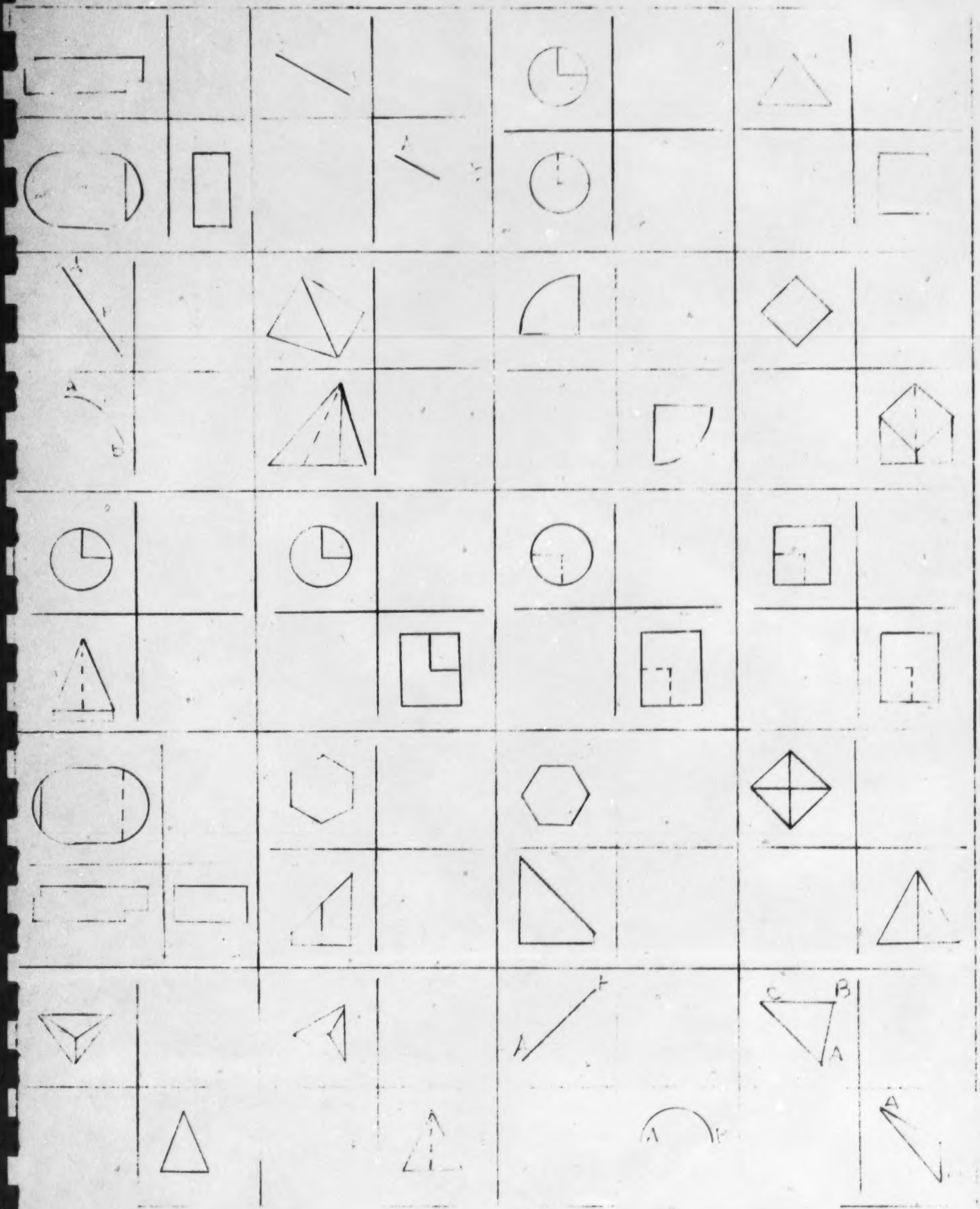
IPC 6.2-Test, drafting: Duplicate all problems on standard format 12x18 tracing format; develop an isometric inset for each problem showing all of the surfaces of the multiview on your isometric. As you develop each isometric view, complete unfinished multiviews by adding solid and or dotted (hidden) lines making all views agree to define a geometric solid.



6.0-Test: Add lines appropriately so that all views are complete.



6.0-.Test (Cont'd): Draw and/or complete missing or unfinished view.



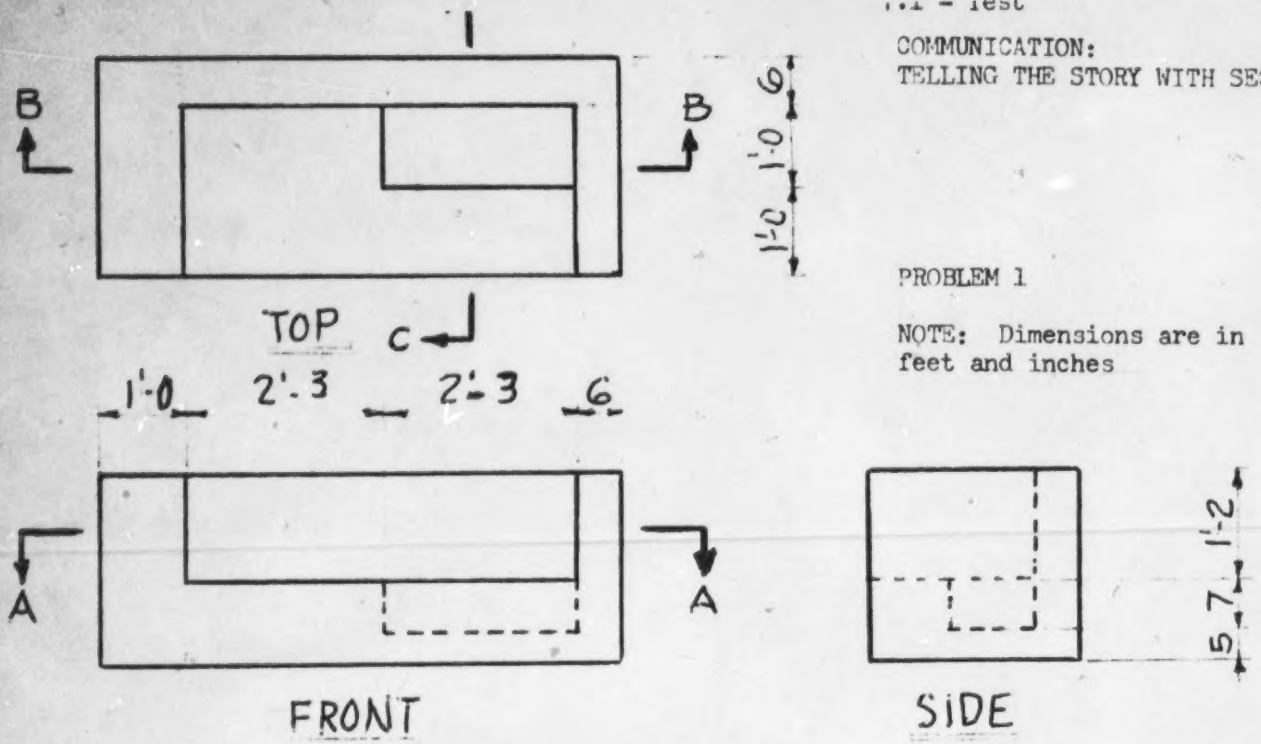
COURSE DRAFTING - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 7.0 ARCHITECTURAL DETAILING

The learner will complete a wall section of a two story residence or a commercial building to the scale of 1 1/2" = 1'0" , complete from footing to roof framing in the approved architectural style with break lines and symbols clearly and neatly shown comparable to the published "Architectural Graphic Standards" with 95% correctly completed.

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
		7.0	Draw a wall section of a two story residence or a commercial building to the scale of 1 1/2" = 1'0" complete from footing to roof framing using the "Architectural Graphic Standards" as your guide.
7.1	Given 5 problem sheets calling for completion of sectional views through objects called for be section cutting plane lines, the student will draw all views called for with 80% accuracy.	7.1	See attached test.
7.2	Given a door detail having numbered parts, the learner will identify each numbered part by completing a numbered list provided with the detail.	7.2	See attached test.

COMMUNICATION:
TELLING THE STORY WITH SECTIONS



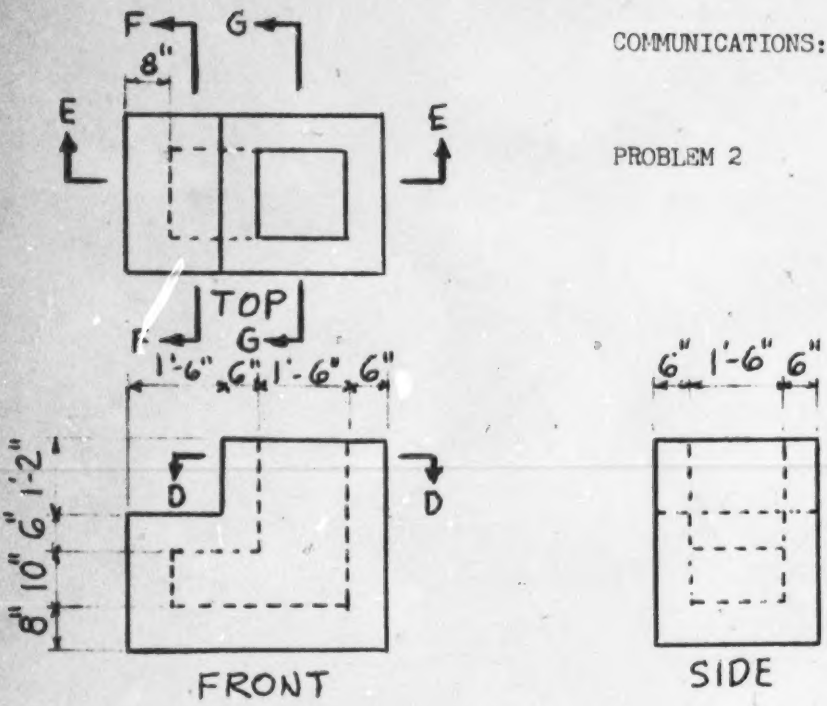
PROBLEM 1

NOTE: Dimensions are in feet and inches

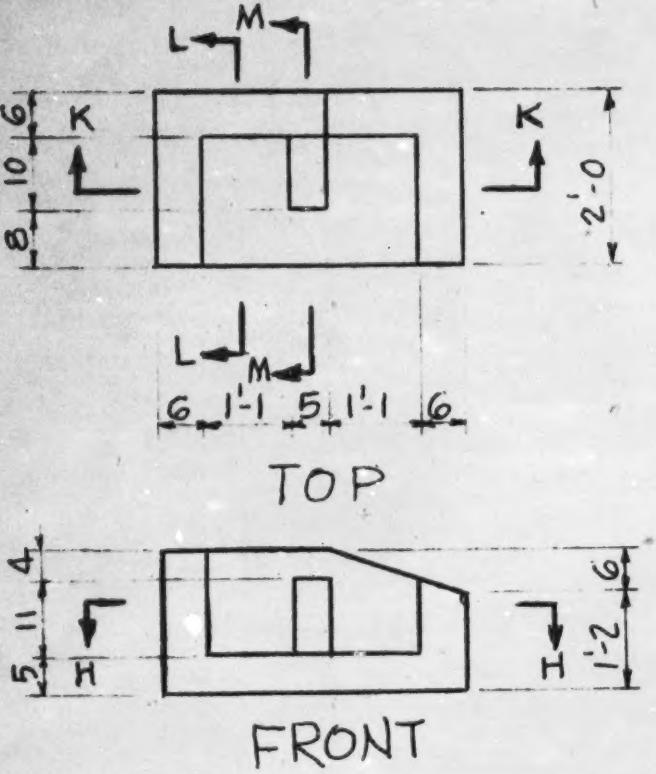
In the space below, using a scale of 1/2" = 1'0", draw sections A-A, B-B & C-C.

COMMUNICATIONS: TELLING THE STORY WITH SECTIONS

PROBLEM 2



In the space below, using a scale of 1/2" = 1'0", draw sections D-D, E-E, F-F & G-G.



7.1 - Test

COMMUNICATION: TELLING THE STORY WITH SECTIONS

PROBLEM 3

NOTE: All dimensions are in inches (unless otherwise shown)

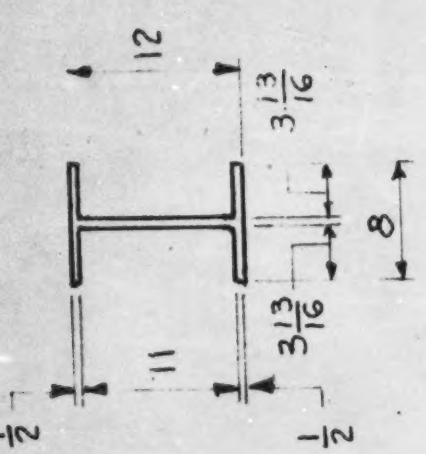
In the space below, using a scale of 3/4" = 1'0", draw sections H-H, K-K, L-L & M-M.

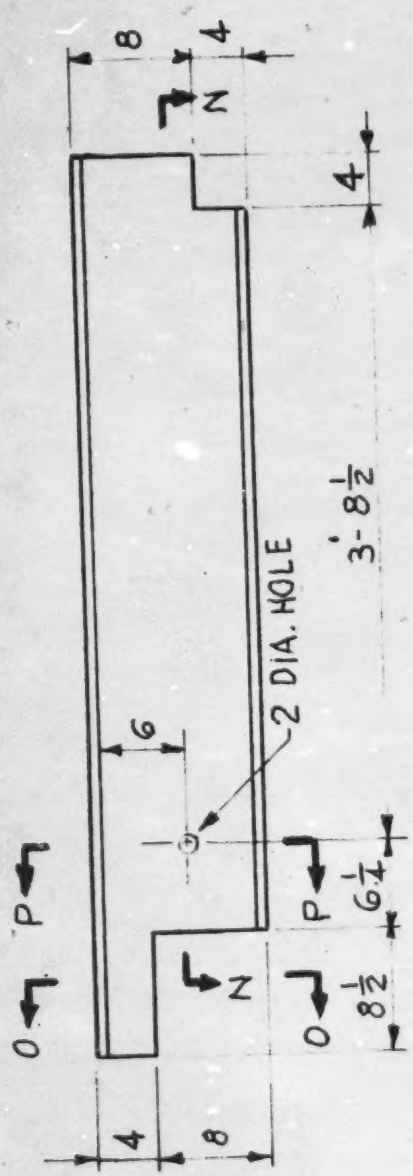
7.1 - Test

COMMUNICATION: TELLING THE STORY WITH SECTIONS

PROBLEM 4

Using a scale of: 1" = 1'0"
draw sections N-N, O-O & P-P.





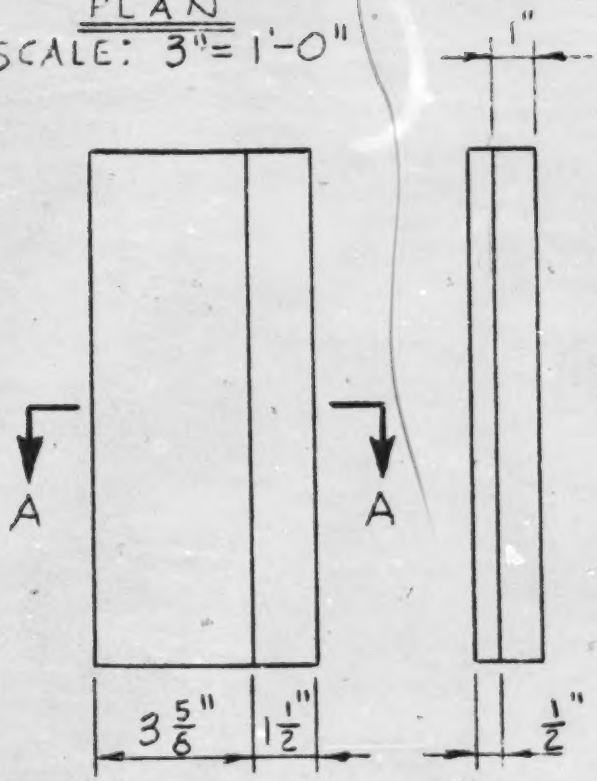
7.1 - Test

COMMUNICATION: TELLING THE STORY WITH SECTIONS

PROBLEM 5

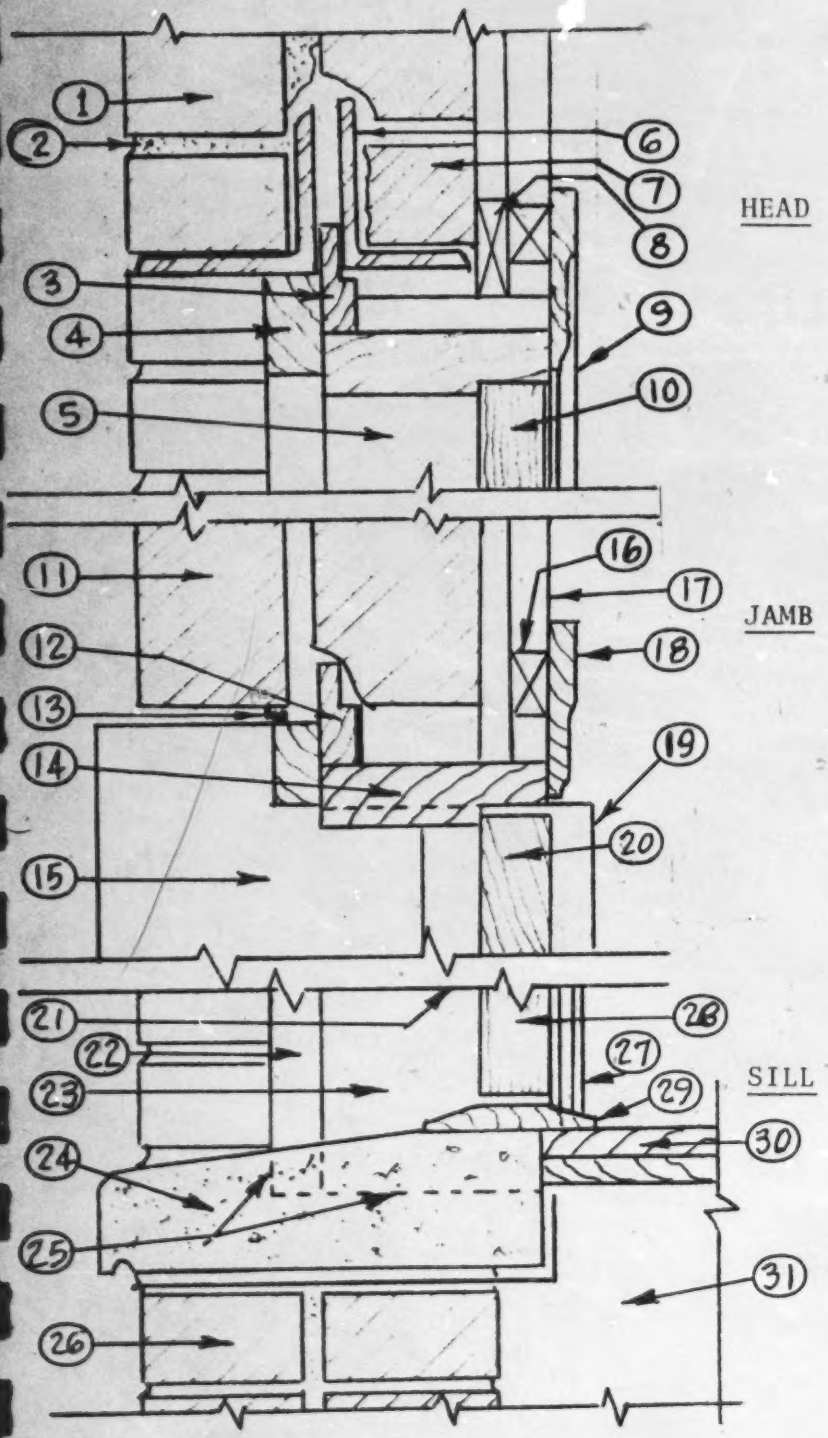
DRAW THE PLAN VIEW HERE

PLAN
SCALE: 3"=1'-0"



Draw section A-A
render wood grain

SECTION A-A (FULL SIZE)



1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____

Numbers 21 through 31 on following page.

Indicate your understanding of the above sectional views by identifying each item designated by a circle and arrow and write the correct name by the corresponding number in the column to the right.

COURSE DRAFTING - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 8.0 SMALL BUILDING PLAN SETS

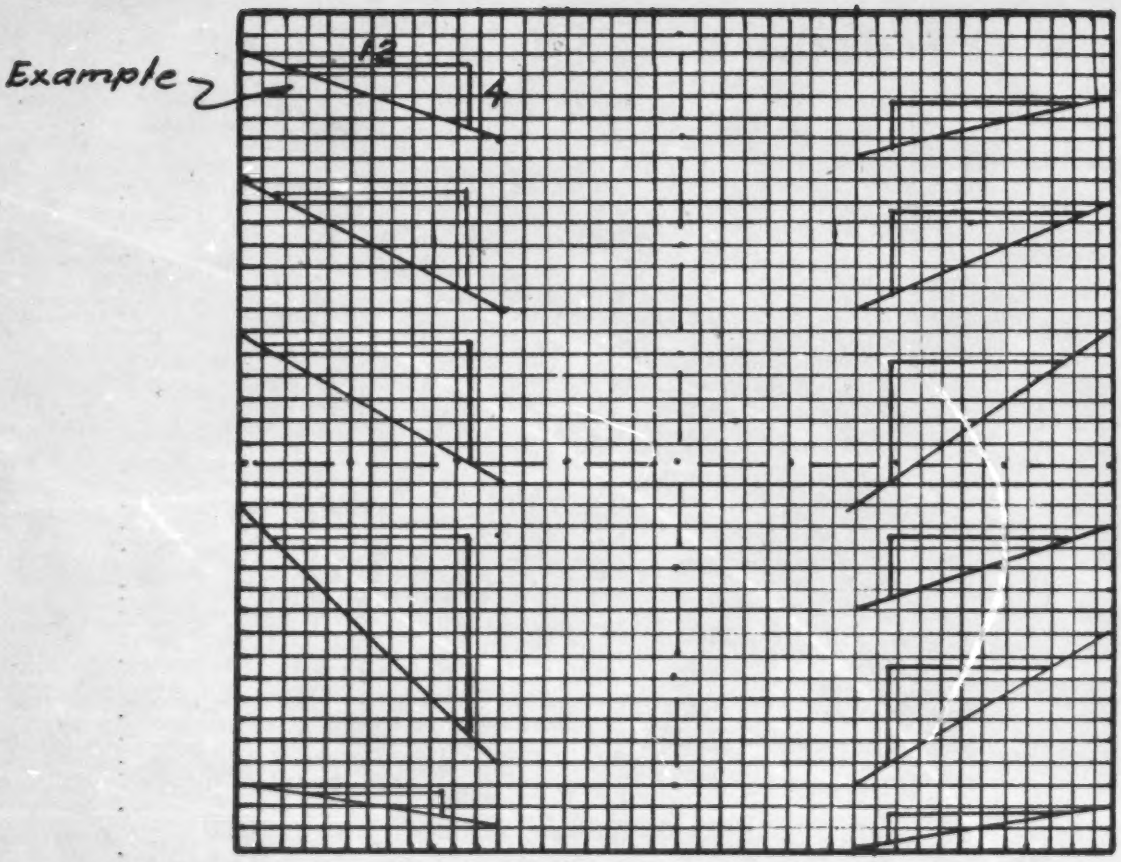
Given architectural plan sets as models, the learner will make a plan view, front view and side view of a small one story building and combing with a site plan in conformance with standard architectural practice achieving a score of 32 or better on the standard rating scale. (See TPO 3.0)

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
		8.0	Make a plan view, front view, side view and site plan putting together all of your work on tracing paper to achieve the highest score possible for you in accordance with attached rating scale.
8.1	Given a list of items to draw calling for use of standard symbols and conventions, the learner will draw on tracing paper all items to an appropriate scale comparable in neatness and appearance with authentic classroom models. All must be acceptable 100%.	8.1	To the scale of 1/4" = 1'0", draw on tracing paper, brief sample views of the following, comparable to model sets available in the classroom. 1. brick veneer wall 2. Electrical: a. wall switch, 3-way b. ceiling fixture, light c. wall outlet d. spotlight e. circuitry diagram wire 3. casement window 4. 2'8" interior door 5. wall, frame house 6. stairs up 7. stairs down
8.2	Given a standard grid format sheet with a series of roof slope indications, the student will place the correct numerals on each with 100% accuracy.	8.2	See attached test. (On grid format)
8.3	Given an 18 item written test concerning the functioning of personnel involved in design and construction in the building process of new construction the learner scores a minimum of 78% accuracy.	8.3	See attached test.

IPO 8.2 - DRAFTING - BASIC

SMALL BUILDING PLAN SETS

Fill in the values that are missing which would be understood by carpenters building a house designed by you. The angle of roof pitch in each case is determined by the vertical and horizontal values revealed by the grid.



IPO 8.3 (cont'd)

5. A "schedule" on a steel reinforced concrete drawing is:

   a. a summary of all bars in the structure
   b. a list of times of assembly
   c. a list of all drawings
   d. a list of delivery dates

COMPLETION: Please list the names of at least three of the four "views" you could expect to see on a concrete structure blueprint.

a. _____ b. _____ c. _____

IPO 8.3 - DRAFTING - BASIC

SMALL BUILDING PLAN SETS

MATCHING: Listed below, you will find design and construction functions on the left. On the right you will find a list of positions which are responsible for satisfactory completion of the stated functions. Place the appropriate letter for the person responsible in front of his correct function.

1.____Is responsible for sequence of assembly.
2.____Is responsible for strength of materials.
3.____Creates the exterior beauty and appearance.
4.____Must understand blueprints.
5.____Creates working drawings.
6.____Determines structural arrangements.
7.____Puts structure on exact location.
8.____Numbers parts (such as beams, joists and girders)
9.____Cuts, bends and welds steel to exact dimensions.
10.____Is in the best position to detect assembly problems.

A. Architect
B. Engineer
C. Detailer
D. Fabricator
E. Contractor
F. All of the above

MULTIPLE CHOICE: Please select the BEST answer.

1. Draftsmen use symbols on drawings because they:

   a. reduce drafting time
   b. make drawings simple
   c. make drawings clear
   d. all of the above

2. The symbol # indicates:

   a. the number of the column
   b. the number of the beam
   c. the reinforcing bar size
   d. the number of the drawing

3. A "detailer" usually draws:

   a. all structural details
   b. those details that are requested
   c. one of each typical detail in the structure
   d. all of the above

4. "Ties" are used to prevent buckeling, most extensively in:

   a. beams
   b. columns
   c. joists
   d. slabs

COURSE DRAFTING - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 9.0

MEETS AND BOUNDS

Given an information sheet with bearings the learner will plot a series of three problems,to scale, each of which is a closed traverse. The finished drawings will be complete with all bearings and distances lettered in accordance with accepted engineering practice.

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
		9.0	See attached test.
9.1	Given a north arrow and a series of 10 points, the learner will draw lines from each point in the correct direction according to a given bearing achieving a minimum score of 80%.	9.1	A. N15° 00' 00"E B. N45° 00' 00"E C. S30° 00' 00"E D. S60° 00' 00"E E. S15° 00' 00"W F. N30° 00' 00"W G. S75° 00' 00"E H. N15° 00' 00"W J. S30° 00' 00"E K. N75° 00' 00"W
9.2	Given a north arrow and a series of 10 points, the learner will lay off a properly directed line to scale of 1" = 60' the length of which indicates a scaled distance equal to the distance specified for each point achieving a score of 80% based on correct distance as well as direction.		A. N30° 00' 00"W15' B. S45° 00' 00"E150' C. N15° 00' 00"E80' D. S45° 00' 00"W120' E. S30° 00' 00"W72' F. N75° 00' 00"W53' G. S30° 00' 00"E24' H. N15° 00' 00"W100' J. S45° 00' 00"E100' K. N30° 00' 00"E100'

TPO 9.0 - DRAFTING - BASIC

MEETS AND BOUNDS

To the scale of 1" = 20' plot the following; starting from point A and continuing through point B, C, etc. until a polygon is completed:

A. N45° 00' 00"E 25'
S45° 00' 00"E 25'
S45° 00' 00"W 25'
N45° 00' 00"W 25'

B. To the scale of 1" = 30' plot the following triangular shaped property:

N15° 00' 00"E 60'
S45° 00' 00"E 60'
S75° 00' 00"W 60'

C. To the scale of 1" = 30' plot the following boundaries of an area, measure and indicate the error of closure.

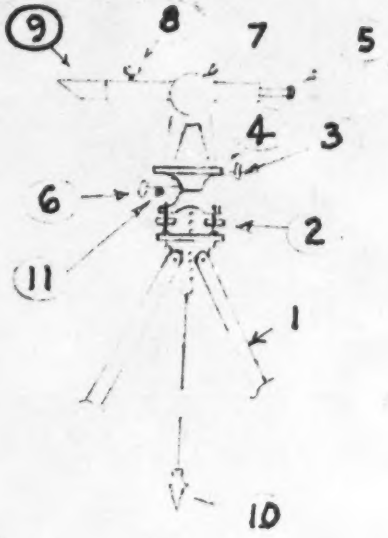
N45° 00' 00"E 64.5'
S25° 00' 00"E 66.0'
S53° 00' 00"W 60.5'
N30° 00' 00"E 42.0'
N75° 00' 00"W 40.0'

COURSE DRAFTING - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 10.0

CIVIL DRAFTING

Given a 30" transit set up, leveled and oriented to an assumed north, the learner turns 10 specified clockwise angles under verbal direction of the instructor such that 8 of 10 angles are correct within 30".

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
		10.0	See attached test.
10.1	Given an illustration of a surveyors transit showing numbered parts, the learner will identify all of the several parts by matching the names of parts with indicated numbers.	10.1	Select the appropriate number from the sketch of a surveyors transit given and fill in the blanks below. ____ Sunshade ____ Eye piece ____ Plumb bob ____ Focusing knob ____ Vertical circle ____ Tripod ____ Upper clamp ____ Lower clamp ____ Upper slow motion screw ____ Lower slow motion screw ____ Leveling screws 

COURSE DRAFTING - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 10.0 (cont'd) CIVIL DRAFTING

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
10.2	Given a five item matching questions concerning the surveyor's transit, the learner will correctly match up all five items.	10.2	Match the following items common to civil engineering: 1. Contour — a. mountain 2. Transit — b. plunge 3. Vernier — c. limb 4. Scope — d. 30-second 5. Tripod — e. elevation ANSWERS: FILL IN THE APPROPRIATE NUMBER OPPOSITE EACH LETTER ITEM. a. ___ b. ___ c. ___ d. ___ e. ___
10.3	Given a six item matching question concerning highway design, the learner will correctly match all five items.	10.3	1. Superelevation — a. profile 2. Fill — b. section 3. Cut — c. mass 4. Diagram — d. overhaul 5. Cross — e. borrow pit 6. Plan- — f. curve ANSWERS: FILL IN APPROPRIATE NUMBER OPPOSITE EACH LETTER ITEM. a. ___ b. ___ c. ___ d. ___ e. ___ f. ___

TPO 10.0 - DRAFTING - BASIC

CIVIL DRAFTING

Under the verbal direction of the instructor, turn with the surveyor's transit the following angles.

1. 0° 20' 00"
2. 5° 40' 00"
3. 6° 52' 00"
4. 1° 02' 00"
5. 25° 21' 00"
6. 121° 42' 00"
7. 272° 05' 00"
8. 359° 00' 00"
9. 7° 08' 00"
10. 33° 57' 30"

COURSE DRAFTING - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 11.0 VICA LEADERSHIP & P.R.

Given the leadership handbook and a list of individual goals, the learner will prepare a calender for VICA activities for the following year to achieve at least four specific individual goals.

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
		11.0	Using VICA materials available to you in the classroom, prepare a calender of your own activities for next year establishing at least four specific individual goals selected from the following list. 1. Candidate for state office 2. State contestant (leadership) 3. Member of opening-closing ceremonies 4. Classification a. Step 1 (citizen) b. Step 2 (committeeman) 5. Leadership classification 6. Industrial classification 7. American VICA degree 8. International industrial degree 9. State contestant (skill) 10. Vocational classification a. trainee b. operator c. specialist d. expert 11. VICA club officer 12. VICA delegate
11.1	Given the VICA leadership handbook, the learner will commit to memory the purposes of VICA listed on pace 62 adequate to pass an examination by the appropriate VICA committee, requiring prompting on no more than four of the eleven purposes listed.	11.1	Study the purposes of VICA in the VICA handbook, apply for examination by the appropriate VICA committee and recite purposes.

COURSE DRAFTING - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 11.0 (cont'd) VICA LEADERSHIP & P.R.

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
11.2	Given the VICA leadership handbook, the learner will pass an oral group test by responding to oral questions concerning the VICA creed to the satisfaction of the appropriate VICA committee.	11.2	Study the VICA creed, page 65 of the VICA leadership handbook sufficient to pass a group oral test administered by the instructor and judged by the appropriate VICA committee.
11.3	Given a copy of the VICA pledge the learner will memorize the four parts to the satisfaction of the appropriate VICA committee.	11.3	Memorize and recite the VICA pledge for approval of the appropriate VICA committee.
11.4	Given a list of P.R. goals the learner will select those achieved through VICA activity.	11.4	Circle items below in which you think VICA achieves worthwhile goals contributing to better public relations for your career program. 1. Better grades for comp students 2. Recognition by parents 3. Recognition by employers 4. Recognition by fellow students 5. Additional jobs for students 6. More cooperation in the classroom 7. Improved school administration 8. Better social climate 9. Improved equipment and supplies for program

COURSE DRAFTING - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 12.0

ENGINEERING TECHNOLOGY CERTIFICATION

The learner will demonstrate a knowledge of the history, organization and requirements of certification of engineering technicians by scoring at least 80% on a written test.

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
		12.0	Test attached
12.1	In rank order the learner will list exactly the three classifications of memberships in the Institute for Certification of Engineering Technicians.	12.1	In the order of increasing rank, list below the three exact classifications of memberships in the Institute for Engineering Technicians. 1. 2. 3.
12.2	The learner will list the names of at least 6 special areas in which Engineering Technicians are certified.	12.2	List the names of at least 6 special areas (architectural, etc.) in which Engineering Technicians are certified. 1. 2. 3. 4. 5. 6.

TPO 12.0 - DRAFTING - BASIC

ENGINEERING TECHNOLOGY CERTIFICATION

Circle T if you think the following statements are true and F if you think they are false.

T F 1. The highest classification for engineering technicians is CET.

T F 2. Graduation from any technical school meets requirements for CET.

T F 3. Certification for technicians began in 1962.

T F 4. Jacksonville is where the Florida Crown Chapter of ASCET was chartered in 1975.

T F 5. The letters ASCET stand for "American Society of Certified Engineering Technicians".

T F 6. The purpose of certification is to make the job entry requirements easier.

T F 7. Four year colleges do not offer programs for Engineering Technology.

T F 8. The nearest test centers for Engineering Technology are in Atlanta, Georgia.

T F 9. One must write to National CET to get information for taking tests to qualify for certification.

T F 10. VICA activity is a good way to become known by technicians in Jacksonville.

Write a short essay about your own situation regarding your planned vocational activity after completing high school. Your essay may begin: I don't think certification in engineering technology would help me because ... (explain); or:
I think certification in electronics and electricity technology may be best for me.. . (explain); also add anything you definitely know you may do to advance toward certification)